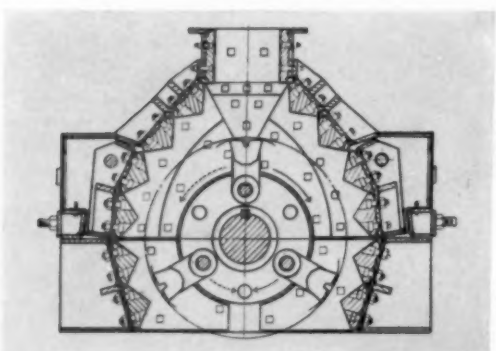
Rock Products

WILLIAMS REVERSIBLE IMPACTOR

Up to 250 tons of aggregate hourly with only 6 men!

Illustrated is Williams No. 445-X Reversible Impactor powered by 250-HP motor. Preceded by a 30 x 42 jaw crusher and apron feeder, and followed by gradation screens in closed circuit, up to 250 tons of aggregate per hour was obtained to meet these Tennessee Highway Dept. specs.:

100	Percent	1"	Passing
80-95	Percent	¾"	Passing
50-85	Percent	⅜"	Passing
36-65	Percent	No. 4	Passing
20-43	Percent	No. 16	Passing
10-21	Percent	No. 100	Passing



Cross section of Impactor. Note wide gap between hammers. High drop chute feeds rock between hammers so it is thrown against impact blocks to set up a ricochet action. Center impact blocks are adjustable with relation to hammers.

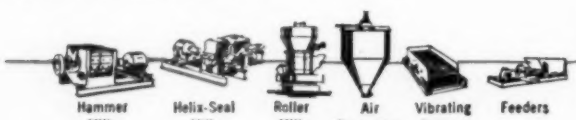
The beaming smile on Clarence Duke, co-owner of Burns Stone Company of Burns, Tennessee, indicates his complete satisfaction with the amazing output of his Williams Reversible Impactor. Hitting the Tennessee Highway Department's tightest aggregate specification right down the middle on the "fine" side, the Williams Impactor produced an average of 200 tons-per-hour, frequently reaching *250 tons hourly with only 5 men and Mr. Duke*. Performance was so gratifying he ordered another Impactor for the Burns Company plant at Cumberland Furnace, Tenn. Ben Ferguson, at right, is representative for Southern Machinery Company, Williams' distributor for middle Tennessee and north Alabama, which designed and furnished equipment for the Burns' plants.

HIGHER OUTPUT of BETTER PRODUCTS at LOWER COST

- **100% product sizing** is assured with a Williams Impactor
- **Lower upkeep expense.** No close clearances of impact hammers and blocks have to be maintained.
- **Reversible rotor** doubles life of wearing parts. Eliminates manual turning of hammers.
- **Completely open discharge** allows unrestricted flow of finished material. Closed circuit operation takes out crushed material as fast as made. No over-crushing or grinding.
- **Accessibility-plus!** Easiest of all crushers to service. Complete rotor removable without disturbing any feed mechanism.
- **Heavy steel plate frame**—forged steel oversize rotor shaft—extra heavy alloy steel hammers and impact blocks—many other exclusives insure longer, lower-cost operation.

Ask for brochure

WILLIAMS PATENT CRUSHER & PULVERIZER CO.
2706 North 9th Street **St. Louis 6, Mo.**



WILLIAMS
CRUSHERS GRINDERS SHREDDERS
Oldest and Largest Manufacturers of Hammer Mills in the World

Enter 1207 on Reader Card

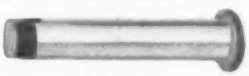
"Full-round" design of Link-Belt LXS chain avoids stress raisers

ROLLERS are accurately machined for correct operating clearances and free-rolling action.

SIDEBARS of selected steel have accurately machined "full-round" pitch holes, which maintain firm, tight press fit of pins and bushings.

FOR POWER TRANSMISSION, LXS chain is generally supplied with offset sidebars. Uniform stress distribution provides extra chain life and safe dependable operation.

FOR CONVEYING AND ELEVATING, LXS chain with straight sidebars and rollers to meet varied operating conditions. A wide variety of attachments is available.



"FULL-ROUND" PINS are made from a tough steel, specially treated for high strength in shear . . . sized for controlled press fit to prevent rotation in sidebars.

"FULL-ROUND" BUSHINGS are properly hardened to shrug off shock, resist wear . . . accurately sized for controlled press fit to prevent rotation in sidebars.

Greater live bearing area extends life

Stress concentration points are eliminated in Link-Belt LXS chain! "Full-round" design avoids sharp corners which may be the starting points of chain failure . . . provides maximum live bearing area between pin, bushing and sidebars. As a result, stress is distributed evenly . . . long chain life is assured under severe conditions.

Pins and bushings of LXS chain are accurately sized . . . assuring controlled press fits, preventing rotation in sidebars. Similar accuracy in machining of sidebars permits close control of pitch and proper chain length after assembly.

Other long-life features of Link-Belt LXS chain include use of selected steels and controlled hardening of all parts. Both contribute to greater endurance . . . greater uniformity.

LXS drives stand up to impact and abrasive service

Large, live bearing area makes LXS chain ideal for exposed drives and abrasive conditions such as found on this heavy rotating drum. Uniform distribution of load over ample bearing area reduces cutting action of abrasives . . . extends chain life.

LXS chain has stamina required for long, heavy-duty conveyors

With its exceptional strength and wear resistance, Link-Belt LXS chain can easily meet rugged conveying and elevating requirements. Due to accuracy of pitch and attachment spacing, plus close matching of multiple strands, LXS has the added strength and wear life necessary for the extra-long conveyors so important to today's highly mechanized industry.

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HEADQUARTERS for chains, sprockets and other Link-Belt products is your nearby Link-Belt factory branch store or authorized stock-carrying distributor. Refer to the Yellow Pages of your local Phone Directory.

LINK-BELT

CHAINS AND SPROCKETS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 14,739

SEPTEMBER 1958

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Cement company triples its capacity with an ambitious expansion program that features a highly conveyorized, big storage plant

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Here is a penetrating study of the rise in costs and productivity since 1939. Here, too, are the results of a survey we conducted on how producers improved or plan to improve their operations

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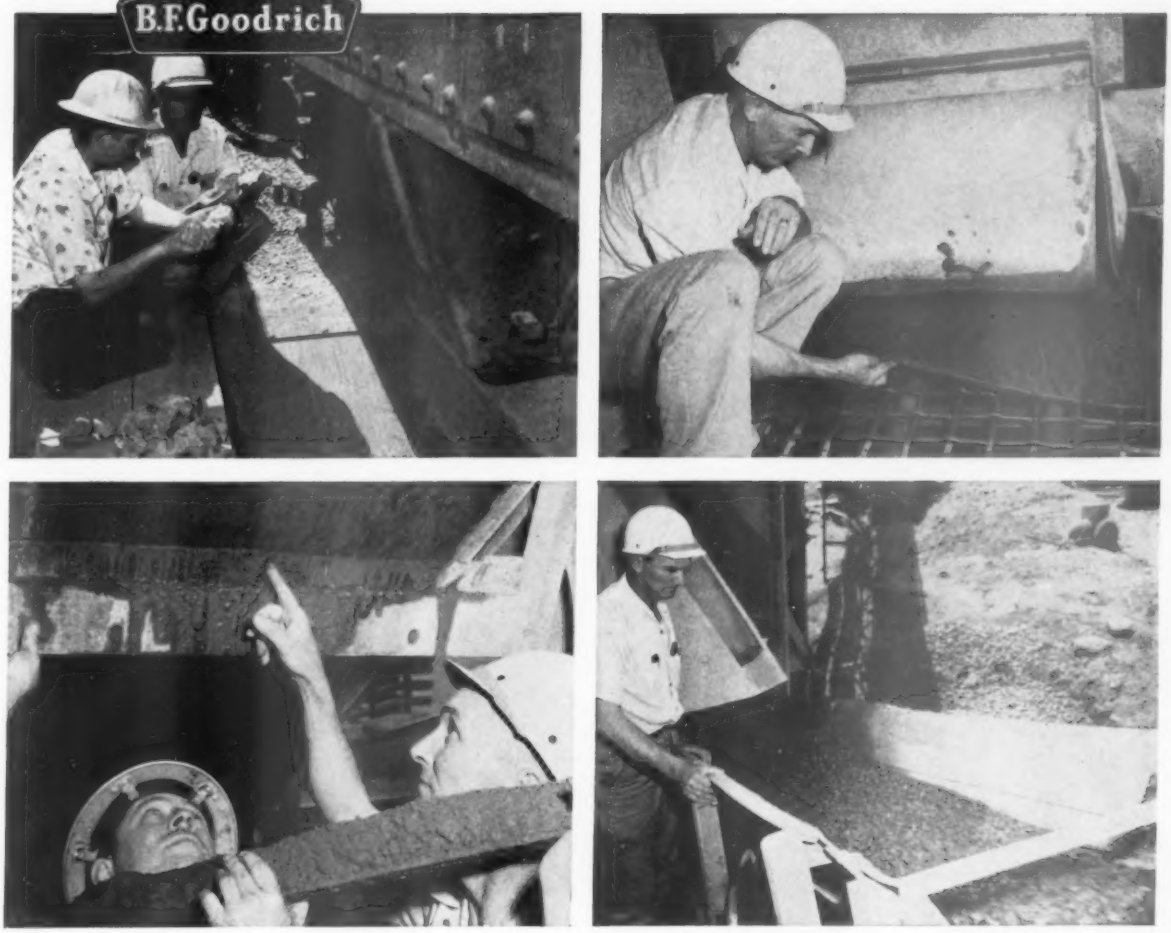

Tougher rubber keeps rocks on the run

B. F. Goodrich improvements in rubber brought extra savings

Problem: Thousands of tons of aggregate crash, skid and scrape through a big concrete plant every day. This terrific beating would soon wear out most materials, but concrete was needed to build a powerhouse and there wasn't time to wait for repairs.

What was done: To avoid costly delays, a B.F.Goodrich distributor suggested that a rubber called Armorite be used at points where wear was greatest. Armorite is specially compounded to stand this sort of a beating. This rubber is soft enough to *give* under the pounding it gets, yet so tough that it's even used in some places to carry broken glass.

Savings: Armorite, used to line a steel chute (upper left), has stood up under a daily 7000-ton avalanche of rocks for four months with no repairs or delays of any kind, is expected to last another year. It has given a wire-screen (upper right) five times longer life by protecting it from falling rock. It did a better job wiping the underside of a belt (lower left) than the steel belt scraper it replaced, and there's less danger of belt wear. Used as a flexible skirtboard centering the load on the belt (lower right), it prevents damage from rocks caught between skirt and belt, and lasts far longer than other materials.

Where to buy: Your B.F.Goodrich distributor has the exact specifications for the Armorite described here. And, as a factory-trained specialist in rubber products, he *can* answer your questions about *all* the rubber products B.F.Goodrich makes for industry. *B.F.Goodrich Industrial Products Co., Dept. M-429, Akron 18, Ohio.*

B.F.Goodrich *Armorite*

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NEW SAUERMAN SLACKLINE CABLEWAY INCREASES PRODUCTION OVER 25%

Bucket breaks water with heaping load from a 100 ft. depth...

Wherever deep digging is required and operating spans are long, the new Sauerman Slackline is adding to its margin of superiority over other types of excavators. Production increases of over 25% and in some unusual cases as high as 80% are reported.

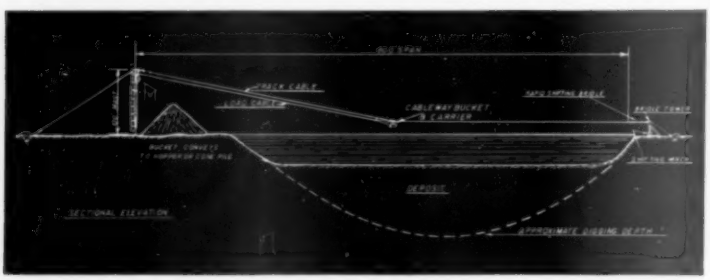
Not only is production increased but operating costs are lowered as cable and hoist wear is reduced and the machine runs with fewer peak loads and shocks—all possible from a cushioned drive using a torque convertor and other refinements.

These benefits are also available to present owners of slackline cableways. Guaranteed Gravel & Sand Co., a Sauerman Slackline user for over 35 years, has increased hoist speeds from 230 to 350 fpm. on the digging cycle and conveying speed to 800 fpm.—a gain of 25%. Guaranteed's 2-cu. yd. bucket is digging 450 ft. away from the surge pile and delivers 150 cu. yds. per hr.

The Sauerman Method lets you work distant material—up to 1,000 ft. away and dig 100 ft. or more below water. Now more than ever the greater tonnage available through fluid drive operation makes a Sauerman Slackline Cableway the low cost way for deep digging.

Get the best machine for your job. Write to Sauerman for expert advice on any materials handling project. For additional information on slackline cableways, ask for Catalog C.

is conveyed and dumped automatically at surge pile.



Above drawing was prepared for a specific slackline installation and does not represent maximum spans. Rapid shifting bridle is not needed for many deposits.

Guaranteed Gravel and Sand Co.'s slackline bucket dumps 150 cu. yds. per hr. on surge pile from digging point 450 ft. away.

SAUERMAN BROS. INC. 630 SOUTH 28TH AVENUE • BELLWOOD, ILLINOIS

CRESCENT SCRAPERS • SLACKLINE and TAUTLINE CABLEWAYS • DUROLITE BLOCKS

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Enter 1218 on Reader Card

GRAVEL PITS CAN BE TOUGH DIGGING, TOO!

LOOK AT the oversize in the foreground—it's too big for the crusher but the shovel *has to handle it.* It's in pits like this that Northwest advantages really pay off. The Northwest Dual Independent Crowd that utilizes force most independent crowd shovels waste brings out a full dipper every time—even when there's boulders in the gravel bank.

Northwest performance on jobs like this mean high output. This is the third Northwest for Rein & Schultz, Inc. of Madison, Wisconsin—their second repeat order. The Model 6 1½-yd. Northwest Shovel is keeping their crushing plant working at full capacity.

Northwests are *real* Rock Shovels from the ground up. A real Rock Shovel makes both the tough digging and the easy digging easier for greater output. Rotating and Crawler Bases are heat-treated alloy steel castings. Machinery Side Frames are alloy cast steel. Here is strength to take the shocks of rock digging, and design that assures permanence of shaft alignment and the elimination of weaving that causes wear.

"Feather-Touch" Clutch Control provides power operation of the main drum clutches and brings ease of operation without the complications of pumps, piping, valves and other delicate mechanisms. Uniform Pressure Swing Clutches eliminate the jerks and grabs that increase swing time and cause spillage. The Cushion Clutch reduces engine dragdown and stalling and eliminates shock overloads before they reach machinery.

Get the full story on Northwest advantages and remember, one out of every three Northwests sold is a repeat order.

Perhaps Rubber Tired Equipment will do your job better. The Northwest Truck Crane brings you a combination of advantages found in no other similar machine. Get the full story before you buy.

5-6-125

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NORTHWEST EQUIPMENT IS BUILT IN THE FOLLOWING SIZES

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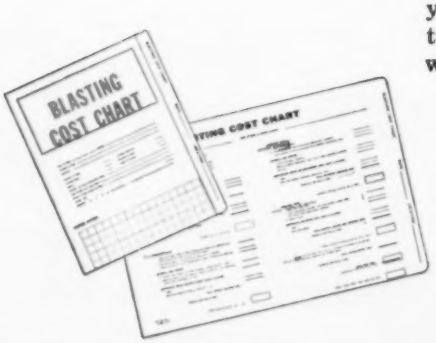
WHAT ARE YOUR ^ BLASTING COSTS?

Get a complete profit picture with new, free Blasting Cost Chart! Let the Atlas Man show you how

Explosives costs alone don't always determine value of a blast. The explosives used have a direct effect on drilling, digging, hauling and crushing costs. Now, a free, simplified computing method—developed by Atlas, gives you a true, complete cost analysis of profits, without involved bookkeeping.

The Atlas Blasting Cost Chart enables you to protect or improve your profits. What's more, it's yours without cost and you can keep your figures confidential. The Atlas representative nearest you will be glad to show you how it works—without obligation.



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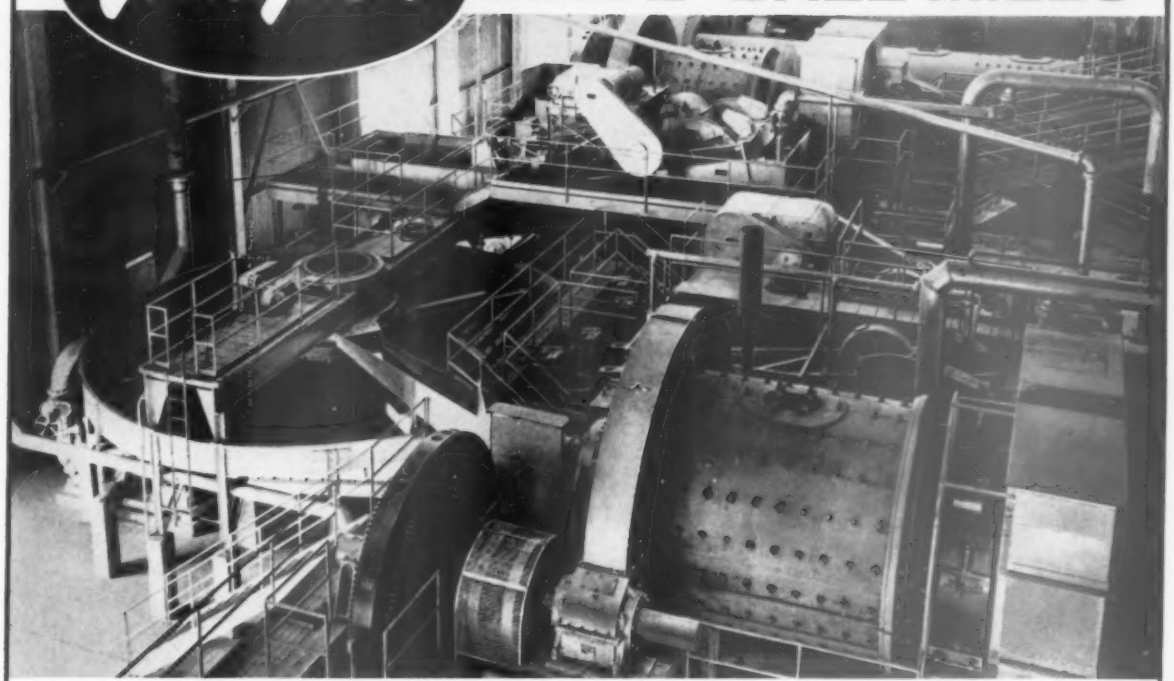
DEPENDABLE

Traylor-MADE BALL MILLS



Traylor Ball Mills are made in two general types—overflow and diaphragm discharge. They are designed and built to be used for either wet or dry grinding. Shells are of all welded steel construction. The trunnions are cast integrally with the detachable heads. Main bearings are made of Meehanite* metal, each fitted with a high pressure Alemite pump.

Driving gears are steel, precision cut on our Maag gear generator. Mills may be fitted with drum feeders, scoop feeders or a combination of the two.

Traylor-made Grinding Mills can be made in any size to meet any requirements. Write for bulletin No. 11-121 for information on Ball, Rod, Compartment and Tube Mills.

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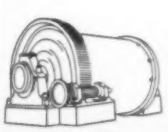
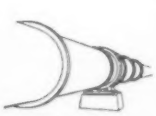
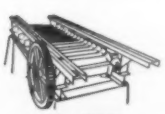


BALL MILLS

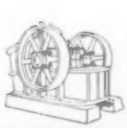


ROTARY KILNS



APRON FEEDERS

PRIMARY GYRATORY CRUSHERS



JAW CRUSHERS

SECONDARY GYRATORY CRUSHERS

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TEXACO LUBRICANTS SPEED

Aggregate production is tough on equipment. Dust, dirt and just plain axle-snapping work make the protection of engines, hydraulic circuits and exposed equipment critically important.

To help keep aggregate production on schedule and maintenance costs low—plant operators can protect these areas with three specialized Texaco lubricants:

Texaco Ursa Oil to lubricate engines . . . It keeps engines clean, prevents wear and rust, helps engine bearings withstand high heats and pressures.

Texaco Regal Oil R&O to improve hydraulic operation . . . It keeps systems clean, free of rust, sludge and foam. Assures efficient operation in any weather. *Texaco Crater X Fluid to fortify wire rope and open gears against destructive forces . . .* It keeps rope strong longer—lubricates and protects gears and

LUBRICATION IS A MAJOR

(PARTS, INVENTORY, PRODUCTION

AGGREGATE PRODUCTION

equipment exposed to year round weather.

These lubricants are part of the famous Texaco Simplified Lubrication Plan, which lets you handle *all* major lubrication with no more than six lubricants. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States. Or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

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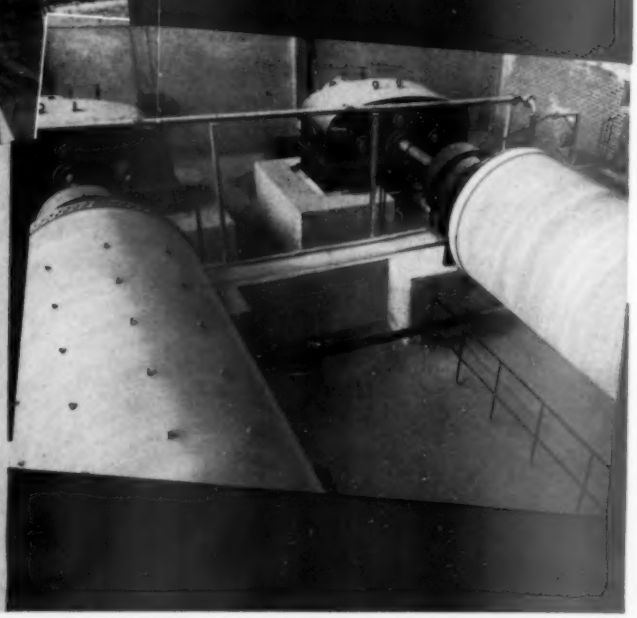

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Engineers and Machinery Manufacturers

11 WEST 42nd ST., NEW YORK 36, N. Y.

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What's Happening

IN OTHER FIELDS OF INTEREST TO THE ROCK PRODUCTS INDUSTRY

September, 1958

A lightweight block of foamed silica that will withstand thermal shock from —450 to 1,600 deg. F. under cyclic temperatures (up to 2,200 deg. F. under continuous temperatures) is being manufactured by Pittsburgh Corning Corp. Appropriately named Foamsil, the insulating and refractory material has a closed cell structure and cannot oxidize or absorb moisture. It is unaffected by acids, except hydrofluoric and hot phosphoric, and according to the company the insulating value of 1 in. of the material is equal to 18 in. of acid brick at an operating temperature of 250 deg. F. Foamsil is being made in various insulation shapes and in 11 x 17 and 17 x 22-in. block, with thicknesses up to 3 in.

Commercial production of foamed aluminum is being planned by Dynamic Metals, Houston, Texas, which has been operating a 1-tpd. batch pilot plant. A new plant, to cost an estimated $1-2 million, will use a continuous process to produce about 100,000 tpy. The new material, introduced last year by Bjorksten Research Laboratories, is expected to find a market in the construction field. Foamed aluminum weighs about 12 lb. per cu. ft. and can be sawed, nailed, cemented and bolted.

Housing starts in June were highest since August, 1956, reports the Labor Department. Rising to a seasonally adjusted annual rate of 1,090,000, private home starts compared with 1,010,000 in May, 1958, and with 995,000 in June, 1957. For the first half of 1958, the adjusted annual rate of housing starts stood at 983,800. Total expenditures for new construction put in place during June were $4.376 billion. For the first six months, value of completed construction was $22.066 billion, a slight gain from $22.058 billion last year.

Four steel mills along the Monongahela River near Pittsburgh will receive oxygen via pipeline from a new 1,000-tpd. plant being built at Duquesne, Pa., by Linde Co. Oxygen will be piped at 250 psi. to the four mills via a distribution system consisting of 7½ miles of pipe ranging from 12 to 20 in. diam. Use of oxygen in steelmaking has climbed from about 30 cu. ft. per ingot ton in 1930 to present national average of 200 cu. ft. per ton. **Chemical Engineering** reports that the portion used for metallurgical operations is expected to grow more rapidly as the industry turns to greater use of oxygen in blast furnaces, open hearth furnaces and the new oxygen converters as a way to boost iron and steel capacity at minimum cost.

Miners ride to and from their work at a West Virginia coal mine on a conveyor, the Manveyor, believed to be the first installed in a mine for the exclusive purpose of moving personnel. The 450 x 26-in. conveyor travels at a speed of 150 fpm. It extends from the mine entrance down a 20-deg. slope to the mining area, a 97-ft. drop in altitude. Running continuously during each shift change, the Hewitt-Robins conveyor moves the miners at a rate of one every six seconds, making the complete trip in three minutes.

The gas industry has reached back into a bygone era for the gas-light revival. Restaurants and merchants have installed the lights to create an old-fashioned atmosphere, but gas men claim the lights have other advantages besides nostalgic charm—they're economical, their glow won't disturb neighbors and they attract fewer bugs. Homeowners are providing the best market for the lights, using them as post lanterns or decorative markers for patios and driveways. Arkla Air Conditioning Corp., a subsidiary of Arkansas Louisiana Gas Co., went into trial production early this year with 100 lamps per day, boosted its output to 1,200 per day and is now projecting 1958 production at 200,000 lamps. "If the gas industry could sell 300,000 lights this year," said an industry spokesman, "it would be almost the same as selling that many gas ranges, adding another 4 to 5 billion cu. ft. to our industry's gas sales." The average modern gas light retails for about $50 installed, including 50 ft. of piping.

Development of a new process for extracting alumina from relatively low-grade domestic clays has led several metals firms to explore the sandhills of North and South Carolina for deposits of red and white alumina clay, according to **Mining World.** Mention also is made by the magazine of investigation of deep-lying phosphate deposits in northeastern North Carolina, where phosphorites contain from 8 to 31 percent P_2O_5. The southern tip of South Carolina is being explored for similar deposits. Sands along the north central coast of North Carolina bear titanium, and both titanium and zirconium ores have been found in central South Carolina.

Construction equipment sales began climbing in July after a year-long dip, and manufacturers were enjoying the production upturn. **The Wall Street Journal** pointed to some recovery signposts: Allis-Chalmers recalled 700 laid-off employes at its Springfield, Ill., crawler tractor and motor grader plant; Clark Equipment Co. began operating its construction machinery division at Benton Harbor, Mich., on a round-the-clock basis five days a week and Frank G. Hough Co., an International Harvester Co. subsidiary, cancelled plans for a two-week vacation shutdown because of increasing production.

Pilot plant operations for extracting oil from shale in northwestern Colorado were suspended by Union Oil Co. of California prior to its announcement of the opening of another pilot plant in Santa Barbara County, Calif., for extracting oil from tar sand deposits. Operations of the Colorado research plant will be suspended for an indefinite period while the company analyzes information obtained. The Santa Barbara operation, called the Sisquoc Tar Sand Experimental Plant, is expected to produce 100 bbl. of oil per day.

Combining the waterproofing qualities of coal-tar pitch with resistance to chemical attack and corrosion of epoxy resins is a new protective coating for metal and concrete surfaces. Makers of the material, called "Epimastic," claim that it can be applied to almost all types of industrial equipment where surface protection is desired.

By pumping adhesives into mine roof strata, coal men hope to make mining safer. In an experiment reported at Wheeling, W. Va., rock layers are bound together ahead of the advancing face before coal is removed.

The editors

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WHY DOES LIMA AUSTIN-WESTERN SELECT LIMA TYPE E MOTORS FOR ROCK CRUSHING SERVICE?

Circles locate some of the Lima Type E Electric Motors used on this Lima Austin-Western Crushing Plant.

"Lima Type E Motors are extremely rugged with plenty of power and an excellent performance record in heavy-duty rock crushing service..."

says Al Bellows
Construction Equipment Division
Baldwin-Lima-Hamilton Corporation

Lima Type E (TEFC) Motors are the original equipment choice for Lima Austin-Western Electrically Driven Crushing, Screening and Washing Plants.

Al Bellows, Sales Manager for Baldwin-Lima-Hamilton Corporation Crushing Equipment, summarizes at right the reasons for their selection. These features of Lima Type E (TEFC) Motors help make Lima Austin-Western Plants (stationary or portable) more efficient in producing high tonnages of aggregate in accurately controlled sizes.

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  Lima Type E (TEFC) Motors are lubricated for life—they require absolutely no maintenance.
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  Lima's specially designed shroud protects the motor from the hazards of rock-crushing service. Rock particles cannot cause motor damage—plants stay in operation.
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EDITOR'S PAGE

George C. Lindsay, Editor

Better check your "fringe" payments

They're going up and up

YOUR EMPLOYES are richer than they think.

Do you know that the fringe-benefit payments you make to them now account for nearly one-fourth of your payroll? Do your employes know it?

If you haven't checked these "hidden" labor costs lately (many do not show up on the payroll nor in the pay envelope), we recommend that you take a good look. You may be shocked at what you'll find.

These fringe payments we're talking about are those that you make to your employes above the regular negotiated straight time and overtime labor rates. Among them are vacation pay, holiday pay, payment for rest periods, etc.—in fact, payment for time not worked. Another class of fringe payments includes those for pensions, social security, insurance, profit sharing and other legally required payments.

You can't get much improvement in your productivity rate directly from payments of this type, but they add materially to the labor cost of doing business. And they do add to the employe's security and well-being, so you can't growl too loudly about that.

A recent survey made by the U. S. Chamber of Commerce shows how you, in your collective bargaining efforts and from the goodness of your own hearts, have added to the hourly cost of productive labor through fringe payments. C. of C. data cover all industry, and may not be exactly accurate for your company or industry. Yet, we're sure they reflect the upward trend of fringe payments you have to make.

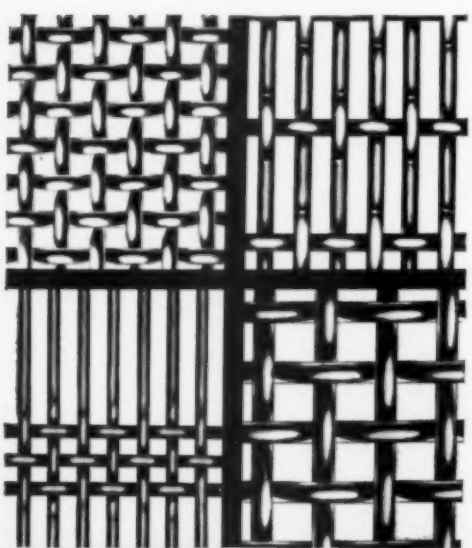
The report shows that payments for vacations, holidays, rest periods, etc. make up a little less than one-half of fringe payments. Costs for pensions, profit-sharing plans, bonuses and the like account for 10.2 percent of payroll costs. And how they've grown over the past 10 years!

As a percent of payroll, these fringe payments rose 58 percent from 1947 to 1957, the report states. Eleven years ago they amounted to $420 for each employe per year. One year ago the comparable figure was $1150—an increase of 174 percent.

Many of these payments don't show up directly in the pockets of your workers, and we're positive that they're not completely aware of the "extra" benefits they get. More important, many producers don't realize it either.

Check reports in this issue (pp. 92-97) on how much direct operating costs have grown, and we think you'll agree that a survey of your own fringe-payment situation will be worth your time and effort.

LUDLOW-SAYLOR designs and makes its own wire crimping dies to insure precision weaving and dimensional stability



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The care in crimping die production is typical of every phase of Ludlow-Saylor manufacture that makes L-S Super-Loy Screens tougher and stronger, more rigid and accurate. They wear longer, stand up better under every operating condition —yet cost no more than ordinary screens.

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ROCKY'S NOTES

NATHAN C. ROCKWOOD

How uniform must portland cement be?

THE FOLLOWING QUOTATION we presume will have a familiar ring to some readers: "Lack of uniformity in portland cement is an important cause of nonuniform concrete strengths. That there are large differences in the strength-producing properties of cements from different sources is well known, although not as generally taken into account in concrete control as it should be. That significant differences, above specification minima, occur for different shipments from the same mill has not been generally recognized." The authors of this statement are Stanton Walker and Delmar L. Bloem in their recent Publication No. 76, National Ready Mixed Concrete Association, "Variations in Portland Cement."

Commercial or merchandising considerations have made it desirable on the part of cement manufacturers to play down any differences between portland cements of various brands. It has obviously been more desirable to promote the use of concrete on the premise that all portland cement was of standard quality and met adequate minimum specifications established by purchasers or users. Such promotion and selling methods also have probably resulted in more ethical sales attitudes on the part of individual manufacturers. It did not become necessary or desirable to knock the competitors' product in order to sell their own—usually good practice regardless of the product sold.

Various large users of portland cement, however, have long recognized differences in the qualities of various brands of cement—particularly public works authorities — and have sometimes tried to get the brand or brands they wanted by specifications of their own writing, since the product must be purchased on public bidding. As the commercial concrete industry developed, it was inevitable that ready-mixed concrete manufacturers should be the ones to become most aware of the commercial significance of these differences in cement. They are more experienced in making concrete, month in and month out, year in and year out, than any other user; and the large concrete manufacturers, at least, make their product under uniform conditions and under constant, uniform control. The timeworn alibi that there are so many variables in making and placing concrete that one can seldom pin some defect on a single factor—the kind of coarse aggregate, fineness modulus of the sand, even the water-cement ratio, etc., is no longer an entirely satisfactory answer.

Under these conditions several important ready-mixed concrete manufacturers insisted that Stanton Walker make an investigation under the auspices of their national association. Knowing well the implications that might be drawn from the results of such a research, if the concrete manufacturers' convictions proved correct, we suspect that this investigation was begun somewhat reluctantly, and carried through and reported upon with the utmost care and accuracy. This is obviously how it has been done, as anyone who studies the Bulletin can see. While this is not emphasized in the report it is plain that the authors make no attempt to evaluate different cements, other than as used in ready-mixed concrete sales. In our opinion they could not have done so if they had wanted to, on the results of 28-day strength tests. What they do emphasize is that the commercial concrete manufacturer must take these variations in cement strengths into account in his control of concrete mixes if he is held to narrow strength-test requirements.

Since much ready-mixed concrete today is sold on specified or guaranteed strengths based on 7 or 28-day tests, it is certainly important for the producer or manufacturer to know: For example, that the variations in the case of a cement from a single source "can be compared with that resulting

Please turn to page 161

Eagle Washing-Classifying-Dehydrating Section Processes 2400 Tons Per Shift For Elmhurst-Chicago Stone Co., Warrenville, Illinois Plant

The 75 year old Elmhurst-Chicago Stone Company operates a number of plants in northern Illinois successfully using Eagle Equipment. Newest of these plants, at Warrenville, is supplying specification material to the new east-west Illinois Toll Road. About 50% material processed is coarse aggregate and 50% fine aggregate.

An Eagle 36" dia. x 30', Double Log Washer processes gravel from top deck of the top screen —does a fine scouring and abrading job. An Eagle 36" dia. x 25' Single Screw-Coarse Material Washer-Dewaterer processes material from second deck of top screen. Bottom deck is #8 mesh—material retained can be directed to either the Coarse Material Screw or to an Eagle 44" dia. x 32' Double Screw Fine Material Unit. The flume under the Eagle 32' Water Scalping-Classifying Tank makes provision for wasting of excess of certain sand sizes. An Eagle-built Sump recovers water from spray bars on the lower screen, below the log washer and coarse material screw, and recirculates it to the top screen. A highly efficient, economical aggregate plant washing section. Compare Eagle Equipment point by point and you will see why it is ahead in design and a better value. Send for Catalog 58.

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Washington Letter

Edgar Poe

Economists Are happier Government economists, who earlier this year were glooomy over the jobless picture next winter and spring, say the prospects have improved substantially. The gross national product (goods and services) will continue to rise the remainder of this year and next.

Total construction will probably be up the first half of 1959 as compared with the corresponding period in 1958. Residential building will probably continue at a rate of about 1,000,000 in 1959. Highway building will be at an all-time high, and military construction will involve the greatest outlay since the second world war.

It is highly important that the federal aid highway funds be allocated as far in advance as possible in order to help the states properly plan their work schedules. For that reason the Bureau of Public Roads announced the 1960 fiscal year apportionments of all federal funds, totaling $3.4 billion, 11 months in advance. The funds ($2.5 billion for interstate and $900 million for ABC roads) were the largest ever advocated in the history of road building in the world.

Thus it is apparent that the tremendous road building program the remainder of this fiscal year and next year will have a favorable impact on the rock products industries.

Bertram D. Tallamy, Federal Highway Administrator, expresses confidence that the mighty highway program will be felt economically across the nation within two years. So far the impact has been strictly on a local and sectional scale.

How the Road program Stands now As the new 1959 fiscal year began, construction was underway on 3,167 miles of the multi-laned interstate highway system at an estimated cost of $1.7 billion. Construction contracts have been completed since July 1, 1956, when the vast program was inaugurated, on 1,771 miles at a cost of $439 million. About $1.5 billion additionally has been spent or authorized for preliminary engineering and rights-of-way.

According to Louis W. Prentiss, executive vice president of American Road Builders Association, the program, in terms of funds obligated, has accelerated at about the rate expected and construction is rising right now toward the high plateau that should be sustained for several years. The steady approach to this plateau is reflected in the annual step-up in fund obligations (federal and state funds) as follows:

Obligations for preliminary engineering, rights-of-way, and contract construction

Fiscal year	Billions of dollars
1957	$1.729
1958	2.223
1959 (estimate)	2.600

Third time's A charm After he had twice vetoed similar measures, President Eisenhower finally signed into law a bill authorizing $1.5 billion of new rivers and harbors and flood control projects. However, money for some of these projects is probably a few years off, while other projects are likely to receive initial funds at the next session. Included in the authorizations—Congress must first authorize before appropriating—are 59 navigation, 14 beach-erosion and 66 flood-control projects.

Taxpayers Get a Break Industries in the rock products field are affected by the new tax revision measure which provides for a fast 20 percent write-off of the cost of depreciable tangible property (both new and used) in the year of acquisition. It provides ordinary loss treatment (up to $25,000 a year or $50,000 a year in the case of a husband and wife filing a joint return) where the original holder of the business sells at a loss.

One of the goals of the tax revision law is to prevent the breakup of small businesses once they

get established. Some advocates believe that the law will aid in curbing the number of mergers. A provision permits the retention of $100,000 in a small business without any fear that the accumulated earnings tax will be imposed. Allowing up to 10 years to pay estate taxes should curb the number of businesses sold in order to pay the federal estate tax which can be devastating.

Road building Costs go up Both highway industry spokesmen and members of Congress concur that all indications are that the cost of road building is going up. The increase in steel prices may be the forerunner of increases in bituminous material, cement, sand and gravel, paint, petroleum products and just about everything else that goes to make up the construction program.

Government economists say the rise in steel prices will be felt all along the line. Manufacturers of road building equipment are preparing for a marked increase in demand from contractors during the next few years. Meantime, some contractors are discovering it is more feasible and economical to lease their machinery from manufacturers than it is to buy new equipment. The manufacturers have leasing plans. Furthermore, the contractors can chalk up the leasing expense as deductible business expense. Under the leasing plan, the road builders do not have to borrow from the banks to make the purchases. Thus far the number of contractors doing the leasing is "comparatively small," but the number appears to be growing.

Aluminum Competes for Bridge market The aluminum industry would like to enter competitively the highway bridge building business sometime in the future. The country's initial aluminum girder highway bridge is scheduled near Des Moines, Iowa. The bridge will be a four-span continuous aluminum girder structure with a reinforced concrete deck. It will be about 220 ft. long, 36 ft. wide with a 30-ft. roadway. The experimental bridge project is being sponsored by Alcoa, Kaiser Aluminum and Reynolds, and the Iowa Highway Commission.

Airports Prepare for Jet age Major airports all over the country have begun making plans for the rapidly approaching jet commercial air age. Runways on a number of the major airports are scheduled to be extended, and airtight terminals are needed to keep out the deafening noises of the swift, high-flying craft. Architects and engineers feel that present airports can be transformed to meet the needs.

Construction work has started on the nation's first specifically designed "jet age" airport for commercial airliners that will carry 150 passengers. Located in Virginia, 27 miles from downtown Washington, the project will cost an estimated $100 million. Congress has already authorized expenditure of half of the sum. The big job immediately ahead is the removal of buildings from the site.

To be known as the Washington International Airport, it will occupy 8,200 acres. Three runways will be built. Two, running north-south, will each be 11,500 ft., and the third, running east-west, 10,000 ft. It is scheduled to be completed in 1961. The Civil Aeronautics Administration, which has jurisdiction over the airport, put a "work fast" label on the project.

Research for Better roads There is more engineering research underway today involving cement, concrete, clay, lime and other road building materials than at any time in history. As a result, roads of the future should be substantially better. The Bureau of Public Roads says various highway departments have continuing projects underway.

Practically all of the states have some type of highly technical research projects to determine the strength of the concretes. Other projects include road materials treated with lime, development of techniques for applying resinous materials for surfacing concrete highways. Some highway departments, for instance, are concerned over the problem of pavement slipperiness, and are making progress in skid resistant surfaces.

Road to Alaska Government and trade association officials agree that a substantial highway building program will be undertaken in parts of Alaska. Roads more than anything else are needed to develop it as the 49th state. A move is underway to provide 1,200 miles of all-weather, hard-surfaced highways linking Alaska with her non-contiguous sister states. The 1,200 miles would all be in Canada and would be a link in the World War II-built Alcan Highway. Under the proposal, which Vice President Richard M. Nixon endorsed, along with others, Uncle Sam would pay half the cost, Canada the other half.

END

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How would you decide?

A round-up of actual day-to-day in-plant problems and how they were handled by management men

Can management discipline employes for faking?

What Happened:

IN A SURVEY conducted by the company, it discovered that one percent of its employes had, at one time or another, made false claims for unemployment insurance. The company posted a notice on the bulletin board that it would discipline any employe who was discovered collecting jobless benefits which he wasn't entitled to. The union took exception to this notice and filed a grievance which came to arbitration. The union argued:

1. When an employe makes a claim for unemployment compensation, he is not on the company's payroll, and therefore not subject to its rules.
2. If the employe has made a false claim it is up to the state to prosecute him, not the company. You cannot try a man twice for the same offense.

The company's answer was:

1. When a man makes a false claim for unemployment insurance, he is cheating the company because management foots the entire bill for jobless benefits in most states.
2. Dishonesty affects the relationship between the employer and employe and the company has a right to make rules which penalize dishonest employes.

Was the company:
Right? ☐ **Wrong?** ☐

What Arbitrator Platt ruled:

"A worker who is laid off is still an employe and is subject to the company rules. The other argument that an employe cannot be held in double jeopardy does not hold water. When an employer discharges an employe for dishonesty or theft, does that stop the state from prosecuting him? It does not. And by the same token, if a state agency presses charges against a worker for making false unemployment claims, the company is not prohibited from exercising its right to penalize dishonest workers. The grievance is denied."

Can an employer hand out "delayed" discipline?

What Happened:

AN EMPLOYER NOTIFIED certain employes that he was levying layoff-penalties against them for their participation in a wild-cat strike. The employes were told, however, that the penalties would be suspended for the time being and they would be placed on probation for one year. The men objected. They demanded that the probation period be removed. The employer refused and the issue subsequently was taken to arbitration.

Was the employer:
Right? ☐ **Wrong?** ☐

What Arbitrator Ryder ruled:

"The employer was within his rights in levying the layoff penalties and then suspending them. In this way he gave notice of what he considered to be proper penalties for the violations. But once the penalties were suspended, the punishment of these violations was complete. The probation period, therefore, must be removed."

(Continued on page 24)

Each incident given in this department is taken from a true-life grievance which went to arbitration. Names of some principals involved have been changed for obvious reasons. Readers who want the source of any of these cases may write to *Rock Products*.

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Labor Relations

continued from page 22

Is "old age" just cause for discharge?

What Happened:

WHEN ED ROHER reached the age of 67 years, he received a note from the company stating that because of his advanced age he would have to be let out. A severance-pay arrangement was suggested. Roher refused to quit, and was fired. At the arbitration this was his defence:

1. I can hold up my end of the job any day.
2. I have worked here for 18 years and never gave any trouble.
3. If I'm not doing a good job, the company should have given me a warning.
4. Since when is 67 years of age too old to work?

The company stated:

1. Competition is getting keen and we need younger men to stay in business.
2. At 67, Roher doesn't have the pep and stamina of younger workers.
3. It's management's job to judge whether a worker can carry his share of the load. That prerogative can't be taken away.

Was the company:
Right? ☐ **Wrong?** ☐

What Arbitrator Kesselman ruled:

"Discharge must be for inability to do assigned work rather than for advanced age. Management has the right to determine whether the man can do the job, subject to challenge for capricious, arbitrary, or discriminatory judgements. A written warning must be issued to the man involved, however. Because this was not done, I order Roher reinstated with back pay."

Must management give a reason when it decides *not* to promote a senior man to a vacant job?

What Happened:

THE COMPANY HAD the following clause in its contract: "In case of promotion, seniority shall prevail at all times where efficiency and capability

are equal"—a common provision in collective bargaining agreements.

In this case, the company got into a hassle with the union over the question of who is to decide an employe's "efficiency and capability" for promotion purposes. The issue arose when Jom Rogers, a senior employe, was passed over for promotion, and management refused to give supporting data for its decision. It took the position that management alone has the authority to decide who is to be promoted, and there is nothing in the labor pact to require it to tell why. The company argued further that the employe has plenty of protection in the grievance machinery. If he is unhappy about management's decision he can take it up as a grievance, and then the company would be under obligation to defend its action.

The company maintained that a business is not a debating society, and management must be free to transfer and promote for the welfare of the enterprise.

The union saw it another way. It maintained that under the clause which the company signed, seniority was the prevailing factor in promotions. Unless the company showed ample proof from the employe's past records that he cannot handle the new job adequately, he is entitled to the position he bid for. Therefore, if a company feels that the senior man is NOT up to the new job, it is obligated, before the grievance machinery is invoked, to justify its position so that the man who was bypassed can know why.

Was the union:
Right? ☐ **Wrong?** ☐

What Arbitrator Logan ruled:

"When a company becomes party to a labor agreement, two things happen: the company gives up the right to exercise final judgment in certain matters, and the company takes on the union as a partner in the discussion and treatment of matters affecting the welfare of the employes and the business. Company and union now has a dual responsibility one to the other. Theirs is the duty of cooperation to the best of their abilities in the construction and maintenance of a progressive program for industrial peace and mutual beneficial performance. It would also seem to be plain common sense that if either party had in mind any action which might cause resentment, they must sit down and go over the matter in an attempt to prove the soundness of the thinking—and at the same time each must submit with an open mind to conviction as to its soundness or lack of merit. I decide that the company is required to give reasons for its actions, before the grievance procedure is invoked, when it wants to promote a junior man."

END

The early forge man, the blacksmith, knew by the particular shade of fiery red when steel was heated to the right temperature for perfect heat treatment. The modern heat treater uses automatic temperature controls to maintain the same color and temperature to guard his quality. Each Coates ball is controlled for this important step in heat treatment and is typical of the care in manufacture, the rigid quality controls and adherence to product specifications that guarantees the uniformity of Coates Triple-Forged Carbex Grinding Balls.

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- **Greater fuel economy**
- **25% fewer parts**
- **All wearing parts interchangeable**

P&H Diesel units are also available as direct power and for diesel-electric generators. It will pay you to specify P&H Diesel for your new crusher or your next repowering job. Contact your P&H dealer. Or write, Dept. 420A.

P&H combination power unit and generator set powering a Baldwin-Lima-Hamilton 201E Crusher through a Cotta Reduction Gear and driving a 50 KW generator. Owned by Yoder Asphalt, Inc., Elkhart, Ind. Sold by Korte Bros., Ft. Wayne, Ind.

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PEOPLE IN THE NEWS

M. A. Swayze receives ASTM Award of Merit

MYRON ALLAN SWAYZE, director of research, Lone Star Cement Corp., New York, N.Y., received an Award of Merit at the recent meeting of the American Society for Testing Materials "in recognition of long-time, valued service and support of ASTM administrative and technical activities, especially for constructive contributions to the work of Committee C-1 on Cement." Mr. Swayze has been active in ASTM since 1925. He served as a director from 1939-41 and from 1952-55. He has been a member of ASTM Committee C-1 on Cement since 1930 and has served as chairman of several of its subcommittees.

A native of Lima, N.Y., Mr. Swayze received his B.S. degree and a degree in chemical engineering from Cast Institute of Technology, Cleveland, Ohio. He has been associated with the Lone Star Cement Corp. since 1913, when he became assistant chief chemist of the Dallas plant. Since then he has served as chief chemist for the Houston plant; chief chemist for the Hudson, N.Y., plant; and assistant chief chemist for the Lone Star Cement System. In 1934 he became director of research for Lone Star Cement Corp. In 1945, Mr. Swayze made a survey of German cement industrial capacity for the Foreign Economic Administration.

In addition to ASTM activities, Mr. Swayze is active in the Portland Cement Association and the American Concrete Institute. He was a director of ACI in 1944-45 and 1948-50, and is recipient of the ACI Wason Medal for noteworthy research.

Kentucky Stone vice presidents

R. E. DEZONIA has been promoted from sales manager to vice president in charge of sales, Kentucky Stone Co., Louisville, Ky. Ray Vencill, superintendent of western operations, has been named vice president in charge of western operations, and W. T. Brooks, formerly vice president and secretary, has been made vice president and treasurer, succeeding Verne C. Morgan, treasurer, who has retired. Harvey Scribner, Jr., of the accounting department, has been appointed secretary.

Sales representative retires

THOMAS F. SHEEHAN has retired as sales representative in the Nebraska, Iowa and Northwestern Missouri territory of the Lyman-Richey Sand & Gravel Corp., Omaha, Neb., after 38 years of service.

Robert J. Hummel joins Houdaille Industries

ROBERT J. HUMMEL has been appointed special assistant to the president of Houdaille Industries, Inc., Buffalo, N.Y., according to an announcement by Ralph F. Peo, president and chairman of the board. Mr. Hummel has had 38 years' experience in the construction materials industry, serving in administration, sales and production capacities, his most recent position being vice president and general manager, Consumers Division, Vulcan Materials Co., Chicago, Ill. Prior to this, he served as sales manager of the National Stone Co., Joliet, Ill.

Mr. Hummel is a past director and member of the executive committee of the National Ready Mixed Concrete Association and a past president and director of the Midwest Ready Mixed Concrete Association.

Universal sales manager

JOHN T. HUGHES has been appointed New York sales manager of Universal Atlas Cement Co., New York, N.Y. He succeeds William J. Plant who has retired after 42 years of service with the company.

Mr. Hughes is a native of Cambridge, Mass., and received his A.B. degree from Harvard University. He joined the Boston office of Universal Atlas in 1946 as salesman and in 1955 he was appointed assistant sales manager for the New York territory.

Mr. Plant, born in New York City, joined U. S. Steel Corp. in 1916 and served in the president's office until 1930, when he was transferred to Universal Atlas Cement Co. as special sales representative, and in 1938 was appointed assistant to the vice president of the eastern and southern sales regions. In 1952, he became sales manager of the New York territory.

Eugene Casler retires; IMC phosphate manager

DR. EUGENE T. CASLER, manager of the Florida phosphate minerals operations of International Minerals & Chemical Corp., Chicago, Ill., has retired after 45 years of service in the phosphate industry. He will be succeeded by Floyd B. Bowen who will assume direct responsibility for the management of the Florida operations in addition to his duties as production manager for all IMC phosphate mining operations.

(Continued on page 31)

22-Year Record

375 UNITS since 1935

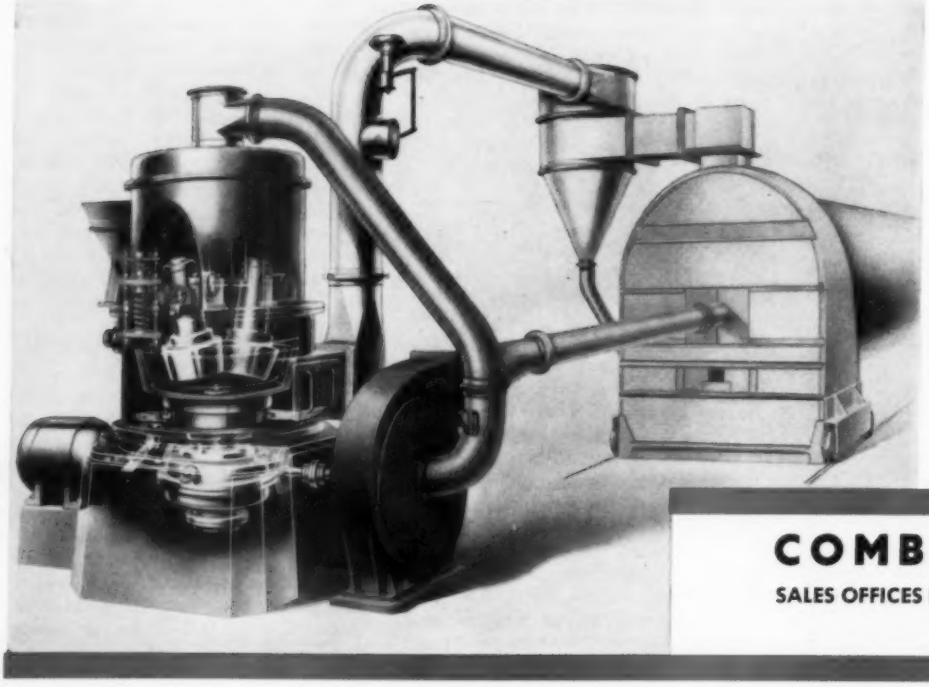
THE development of Raymond *Bowl Mill firing* is another success story of modern industry. Its continual growth in popularity right up to the present date is based on its dependable performance for the past 22 years.

The first experimental Bowl Mill was tested and proved under actual service conditions in 1935. The year 1936 marked the beginning of wide-spread acceptance of the Bowl Mill for direct firing rotary kilns.

The opposite page shows the rapid climb in yearly Bowl Mill output, measured in tons of coal pulverized.

From the original units installed in 1935, the list has grown to 375 mills at the end of 1957. Rated capacity has increased to more than 18-½ million tons of coal per year, used in kiln firing alone.

The continued leadership of the Raymond Bowl Mill is a proof of its ability to lower over-all costs and to insure top-level efficiency in kiln operations.



The Raymond Bowl Mill provides a complete fully coordinated system of coal pulverizing and direct firing for rotary kilns in production of lime and cement.

For further details, ask for Raymond Bowl Mill Catalog #75

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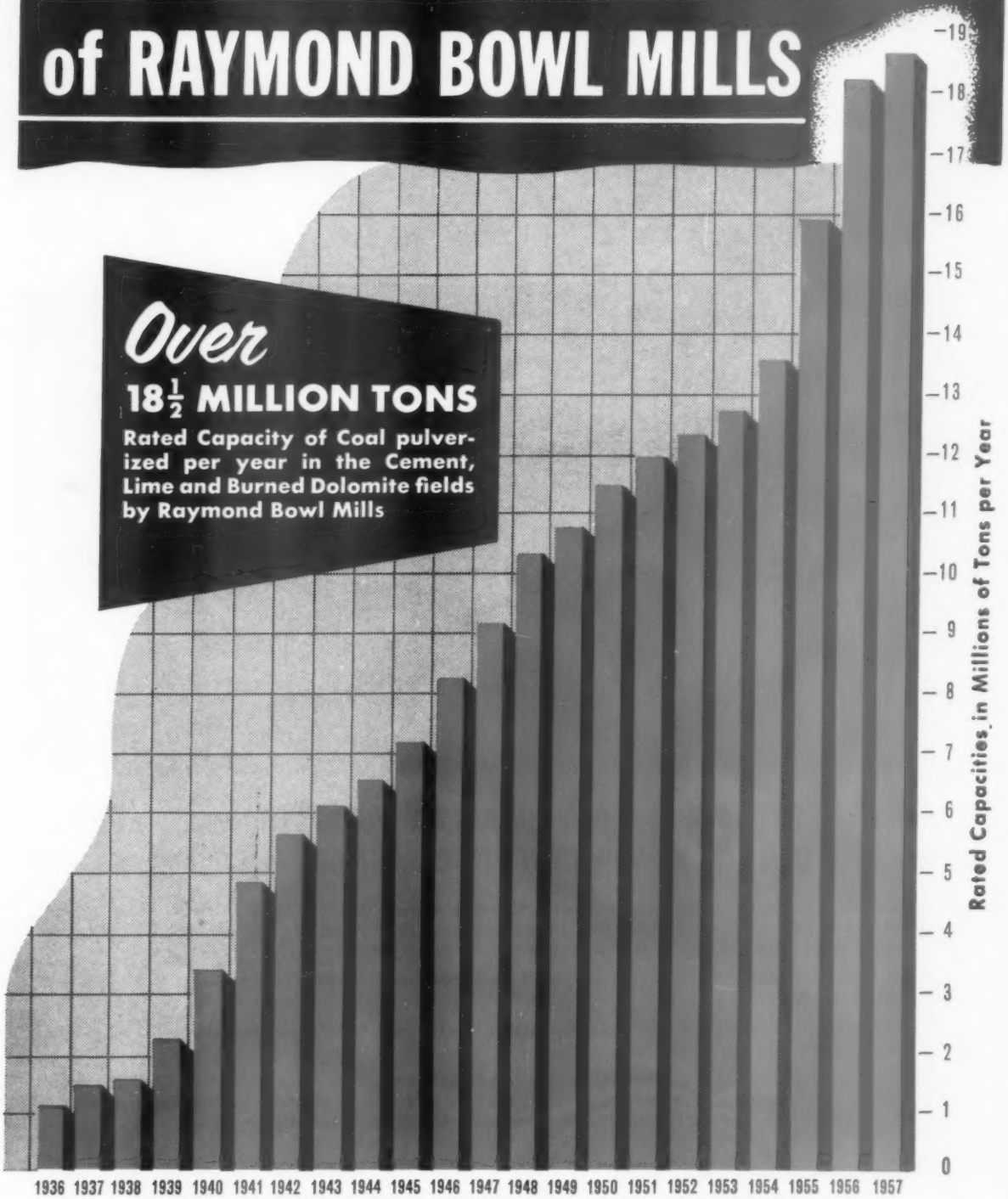

SHOWING YEARLY GROWTH OF RAYMOND BOWL MILL FIRING

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RAYMOND DIVISION
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COMBUSTION ENGINEERING-SUPERHEATER LTD., MONTREAL, CANADA

BOWL MILL

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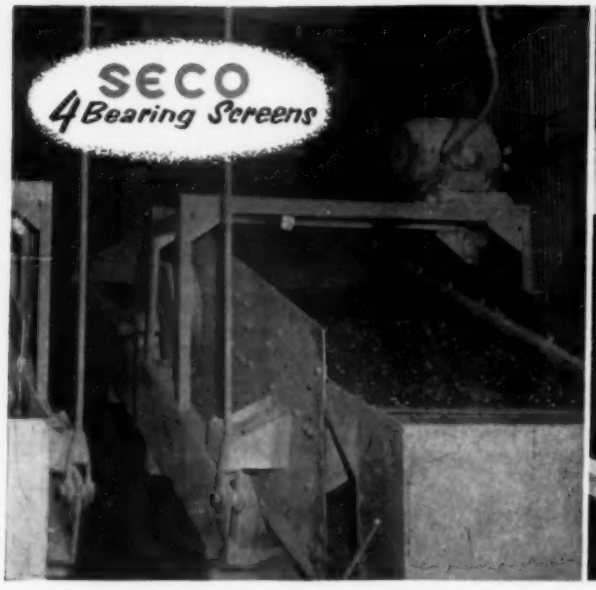

TIME-PROVED SECO SCREENS GIVE INCREASED TONNAGES, MORE ACCURATE SIZING, WITH LITTLE OR NO DOWNTIME! THERE'S A RIGHT MODEL FOR ANY JOB!

Now, there's a Seco Twin-Bearing or Seco 4 Bearing screen that's exactly right for any aggregate screening job . . . from Ag-lime to rip-rap . . . single, double, triple, 3½ deck models and special models engineered to meet your exact screening requirements.

Take it from producers who know . . . you'll be ahead in trouble-free volume performance with SECO screens on your job.

They're designed, engineered and manufactured by folks who have been specializing in vibrating screens exclusively for over 25 years.

With customers demanding cleaner, better sized products, you can't afford to put your material through obsolete or inferior equipment. Go modern . . . with Seco 4 bearing screens or Seco Twin-bearing screens . . . the 2 best ways to profit on aggregate screening.

Write SECO for recommendations for your job now!

NOW IS THE TIME TO MODERNIZE

WITH SECO SCREENS . . . FOR GREATER PROFITS

Send for SECO 4 Bearing Screen Catalog #204
and SECO Twin-Bearing Screen Bulletin TB-21

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TRUE CIRCULAR ACTION
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PEOPLE IN THE NEWS

(Continued from page 27)

Born in Louisville, Ky., Dr. Casler was graduated from the University of Florida, Gainesville, Fla., with a B.S. degree in chemistry. Upon graduation, Dr. Casler joined the Phosphate Mining Co. as an assistant chemist. This company later merged with the Virgia-Carolina Chemical Corp. After serving with the Air Nitrates Corp. during World War I, he rejoined the Phosphate Mining Co. as chief chemist at Nichols, Fla., in 1922, advancing to chemical superintendent and chemical director.

Dr. Casler became associated with International Minerals & Chemical Corp. in 1942 as project engineer at Chamberlain, S. D. Later, he was made division engineer on the Chicago staff and assigned to the Tennessee operations. In 1943, he was transferred to Mulberry, Fla., as assistant manager of the phosphate rock operations, moving to Bartow when the new offices were built there. He later became assistant manager of production. He was appointed manager of the Florida phosphate minerals operations in 1956.

Dr. Casler is a member of the American Institute of Mining, Metallurgical and Petroleum Engineers.

Zonolite operations manager

JOHN F. MCCORMICK has been appointed plant operations manager of Zonolite Co., Chicago, Ill., according to an announcement by R. W. Sterrett, vice president and general manager of the expanded products division. Mr. McCormick joined the firm in 1953 as plant manager in North Billerica, Mass. He later served as production engineer and quality control supervisor. He was formerly associated with Johns-Manville and Minneapolis-Honeywell.

G. Rhea Taylor has been named manager of the Little Rock district covering Arkansas and parts of Tennessee and Mississippi. He joined the company in 1954.

J. R. Kringel named director

JOHN R. KRINGEL, vice president of production, New York Trap Rock Corp., New York, N.Y., has been named to the board of directors. Mr. Kringel, a native of Denver, Colo., joined the company in 1954 as superintendent of the Haverstraw plant. In 1956 he was appointed assistant vice president of production. He has been vice president of production since April of this year.

(Continued on following page)

"BANTAM

speeds up pit operations 400%

. . . cuts our costs over 50%!"

The job of supplying pit run materials for farm-to-market roads in Highlands County, Florida, is a tough one. With previous equipment this tough material had to be blasted and then loaded. But the BANTAM T-35 dragline digs and loads it in *one* operation!

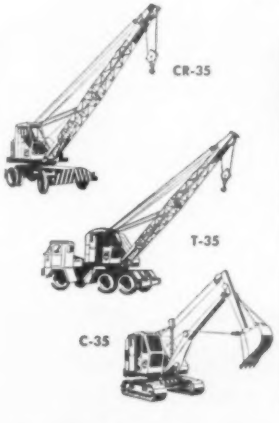
County Commissioner Sidney W. Cooper says, "Our BANTAM speeded up pit operations 4 times! Our cost for producing this material has been cut by more than 50%. We love the BANTAM!"

Keeps 9 Trucks Busy 9 Hours a Day

The BANTAM keeps operations moving at a fast clip on a 5-day-a-week schedule. Nine hours a day the BANTAM loads trucks which haul material to the roads. Time for loading a 5-yd. truck is only 3 to 4 minutes.

See how BANTAM can help you cut your digging and loading costs. Write for literature on BANTAM—the most versatile rig you can own; it works with 10 different quick-change attachments.

World's Largest Producer of Truck Crane-Excavators



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Gentlemen:
Please send me complete information on the BANTAM checked below:

- ☐ Carrier mounted BANTAM T-35
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Inexpensive to install, economical to operate, easy to use —Arcair works with any standard arc welding machine.

WRITE TODAY FOR COMPLETE INFORMATION!

Arcair® Metal Removal Torches

473 S. Mt. Pleasant St., Lancaster, Ohio

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PEOPLE IN THE NEWS

(Continued from preceding page)

Oregon secretary-treasurer

LAWRENCE F. NEWLANDS has been elected secretary-treasurer of the Oregon Portland Cement Co., Portland, Ore. He previously served as treasurer and assistant secretary. A graduate of the University of Washington, Seattle, Wash., Mr. Newlands has been associated with Oregon Portland Cement Co. since 1940. He started his career in the cement industry soon after graduation from college, when he joined the Lone Star Cement Corp.

Emery N. Sundberg has been named assistant secretary.

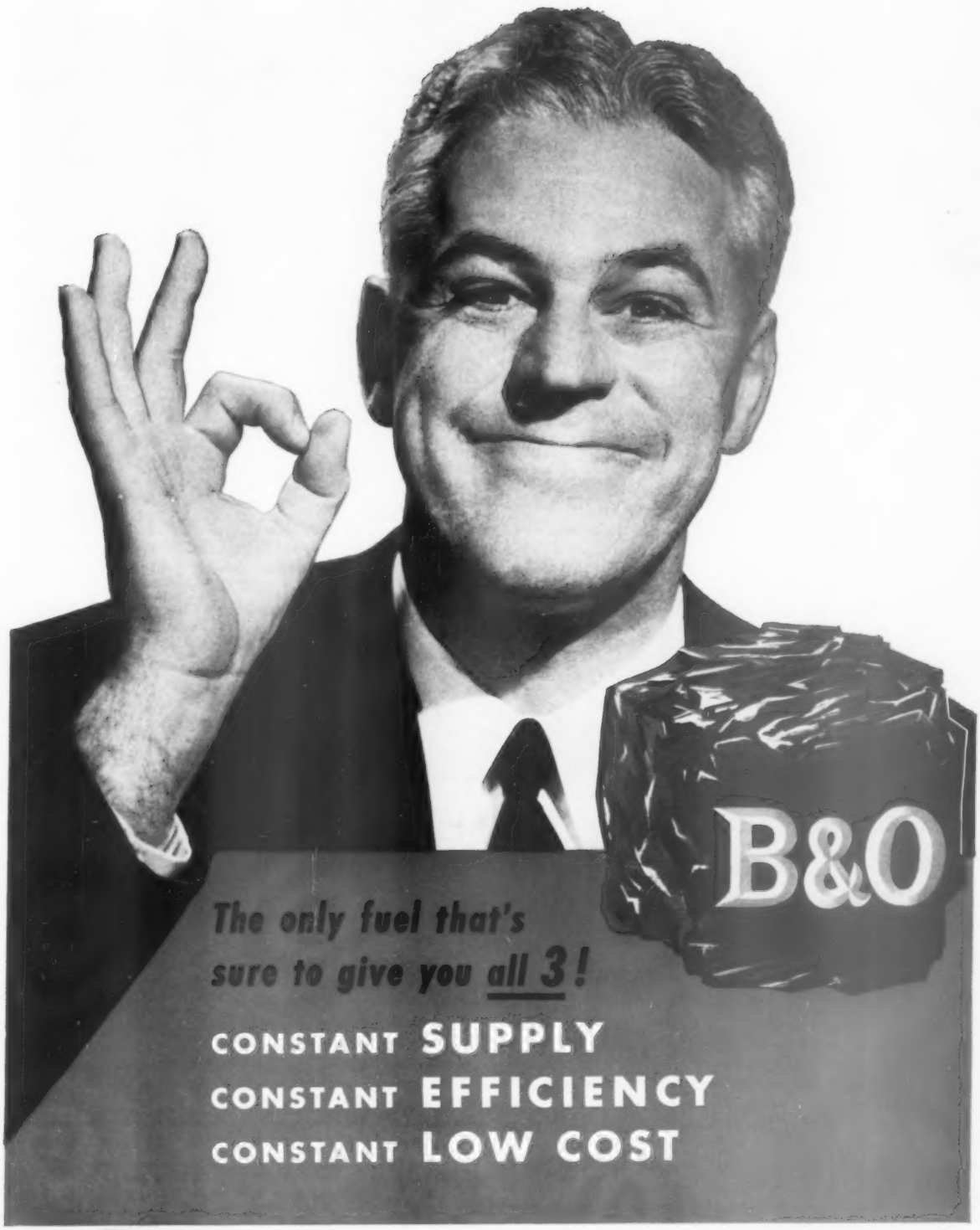
U. S. Gypsum district managers

JOHN F. HARVARD has been named manager of the Great Lakes industrial district of United States Gypsum Co., Chicago, Ill., with headquarters in Detroit. He was formerly assistant manager of the Chicago industrial sales district. Thomas Dilworth has been appointed Detroit district sales manager, replacing F. M. Bell, who has been promoted to field marketing manager of the insulation division. C. A. Nelson, formerly marketing manager for plastering materials, succeeds Mr. Dilworth as Cleveland district manager. W. Deal Alseth, who has been serving as field marketing manager of insulation products, has been named Omaha district manager to succeed the late C. F. McCracken.

Mining consultant

MARK LINTZ, mining and metallurgical engineer, formerly of San Francisco, Calif., now of Prescott, Ariz., recently returned from Toronto, Canada, where he did consulting work on a new Canadian plant. Active in the cement industry for many years, Mr. Lintz returned to the mining field in 1951.

(Continued on page 35)



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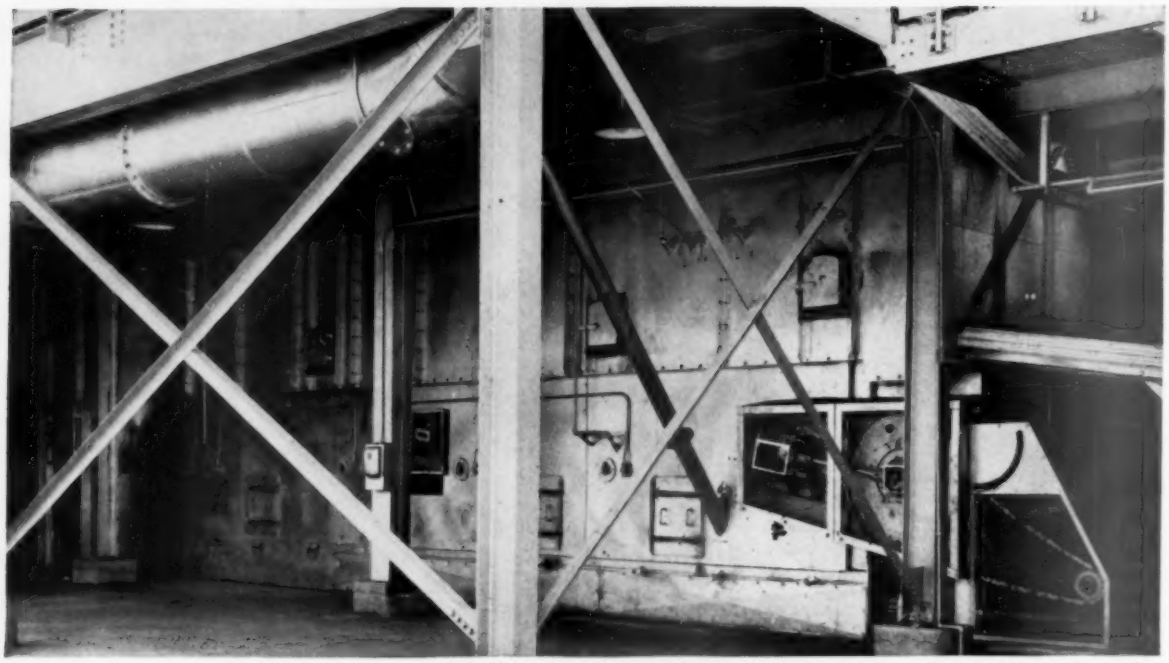
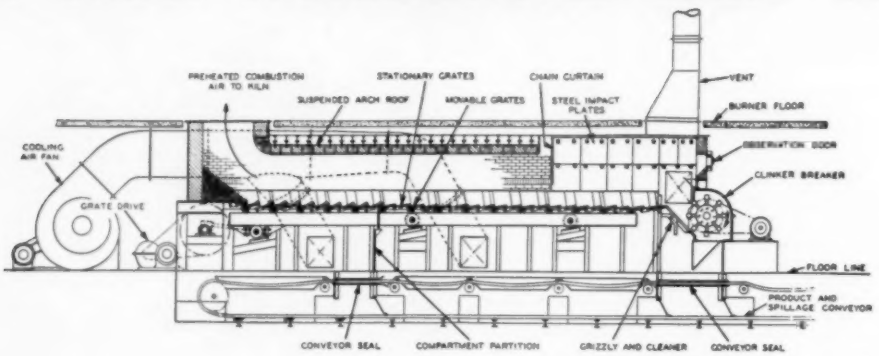


Side View from feed end of a 7' x 44' Horizontal-Grate Cooler, designed for cooling 4,000 barrels of Portland cement clinker per day, showing crank type grate drive

New Fuller HORIZONTAL-Grate Cooler



Cross-section drawing showing construction and arrangement of a typical Horizontal-Grate Cooler with clinker breaker.

Compact . . . Economical . . . Fast-cooling. Already proven in use, the compact, efficient design of Fuller's new Horizontal-Grate Cooler promises savings for many plants. It's an ideal choice where headroom is at a minimum . . . where a short, compact unit is desired.

Like the famous Fuller Inclined-Grate Cooler, the new Horizontal-Grate type is meeting with wide acceptance. One of the new units, already in operation, is shown above.

A Fuller Horizontal-Grate Cooler or an Inclined-Grate unit is the right answer to your cooling needs. Fuller coolers are used for a wide range of materials including lime, dolomite, cement clinker, iron nodules, phosphate nodules, sinter, ores, and others. Fuller sales engineers will be glad to discuss your cooling problems and make recommendations for your plant—without obligation, of course.

Features of the Fuller HORIZONTAL-Grate Cooler

- Requires a minimum of headroom
- Short length if necessary
- Better secondary air temperature control
- Less refractories
- Less installation time
- More rapid clinker distribution
- More uniform bed thickness

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"See Chemical Engineering Catalog for details and specifications".

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PEOPLE IN THE NEWS

(Continued from page 32)

Robert F. Blanks dies

ROBERT F. BLANKS, vice president and general manager of Great Western Aggregates, Inc., and a research consultant for Ideal Cement Co., Denver, Colo., died suddenly on July 14. He was 57 years old. Considered one of the outstanding concrete engineers in the United States, Mr. Blanks had been vice president of Great Western Aggregates, wholly owned subsidiary of Ideal Cement Co., since 1951.

Born in Maple Hill, Kan., Mr. Blanks attended Kansas State College, Manhattan, where he received his Bachelor of Science degree in engineering and also an honorary Doctor of Science degree. In 1930 he joined the Bureau of Reclamation in Denver, becoming chief of the research and geology division. While with the Bureau, he directed research in the development of low-heat cements, sulphate resisting cements and techniques for placing mass concrete. The cements and techniques developed under his direction were used in Hoover, Grand Coulee, and Shasta dams. Mr. Blanks was author of the book, "Technology of Cement and Concrete," published in 1955, written in collaboration with the late Henry Kennedy.

Mr. Blanks was a past president of the American Concrete Institute and the Colorado Society of Engineers. He had been a member of the General Technical Committee of the Portland Cement Association, Concrete Research Committee of the National Research Council, chairman of the Reinforced Concrete Research Council of the Engineering Foundation, Harvard University, as a special lecturer on concrete technology, executive committee of the American National Commission of the International Committee on Soil Mechanics and a member of many engineering societies.

END

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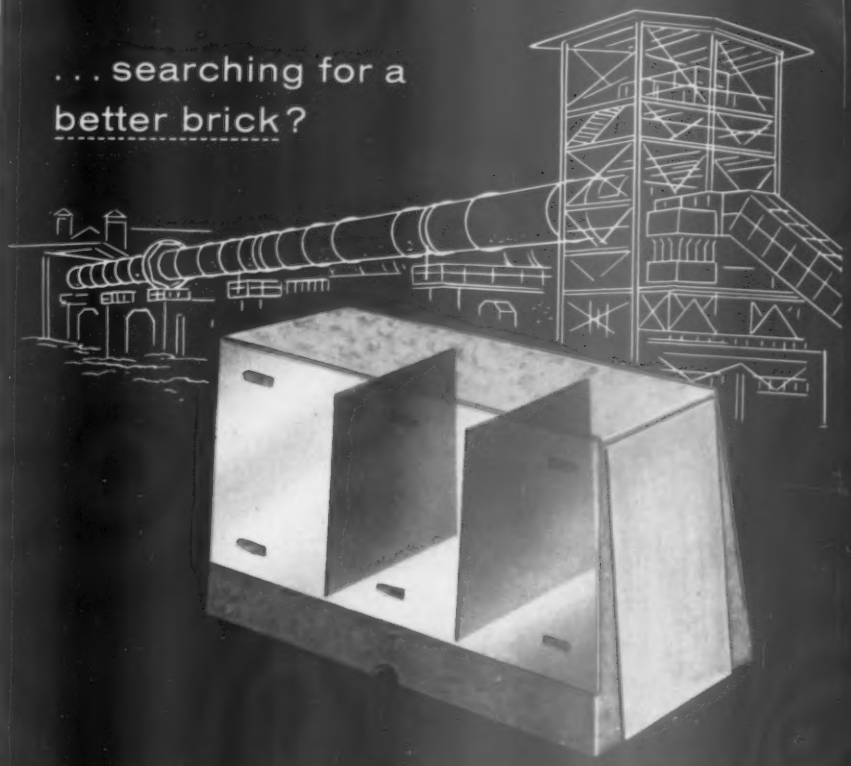
. . . searching for a better brick?



STEELKLAD-EE

the original internally plated brick . . .

Burning zones of portland cement rotary kilns—seared by tongues of flame 30 or 40 ft. long and handling routine temperatures of 2800°F. or more—pose supremely tough tests for refractories.

In STEELKLAD-EE (the newest type of basic refractory brick with steel plates bonded to it as integral parts) Grefco has produced for the cement industry a superior refractory with significant advantages:

1. *Lower thermal conductivity than burned brick*
2. *Increased spalling resistance*
3. *Positive taper identification*
4. *Double steel plates in radial joints*
5. *Superior coating characteristics (for faster clinker coating build-up, longer life)*
6. *Built-in expansion allowance (cardboard expansion strips attached)*

The cut-away view above shows how STEELKLAD-EE's exclusive internal bonding molds the steel plates right into the brick itself, making three bricks of one. These smaller refractory units are better able to withstand the punishing cycles of heating and cooling—mean longer life, fewer shutdowns. STEELKLAD-EE is a *better brick*, any way you view it!

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• Please consult your local Grefco representative for advice on any of STEELKLAD-EE's numerous applications. STEELKLAD-EE brick is available from Grefco plants in Baltimore, Gary, Los Angeles, and in Smithville, Ontario.

FACES AND PLACES

. . . Candid shots of people in the

Enlightened student

Frank Leftwich, American engineer who developed the Aglite process for production of lightweight aggregate, runs a practiced eye over some precast beams and detects differences in densities. Photographed during a visit to a concrete products plant in Europe, Mr. Leftwich was with the group of Americans on a concrete industries study tour

Blessing or bane?

Highway construction has provided a wonderful market for his product, but here, says H. D. Wince, is a case in which a good wind blows ill: U. S. Highway 6 is being relocated right across the Alpha Portland Cement Co. quarry at LaSalle, Ill. Seated at his desk, Plant Superintendent Wince ponders his problem

They're from Missouri

Accompanying Arthur R. Alvis to Chicago for the midyear meeting of National Crushed Limestone Institute were his wife, center, and their daughter, Nancy, left. Mr. Alvis is owner of Alvis Limestone & Concrete Co., Butler, Mo.

Photo by Hamilton Wright

Cement for China

Not only is Free China producing enough cement to supply its needs, it also anticipates exporting about 200,000 tons to Far East neighbors. At the Kaohsiung plant of Taiwan Cement Corp., Chun-hsien Loh (wearing pith helmet) chief of the engineering department, checks load of cement with a worker

Ideal alligator

An alligator that can't bite is certainly the best kind, assert these employes at Ideal Cement Co.'s Portland, Colo., plant. To symbolize the danger of moving machinery and the need to use safety locks, they built the alligator from a section of old screw conveyor housing, a few screw flights, several feet of pipe, plywood and ingenuity. Shown with their creation are (l. to r.) Al Knisely, Louis Scutti, Lloyd Rosenstrauch, William Sudo and Charles Kunkle

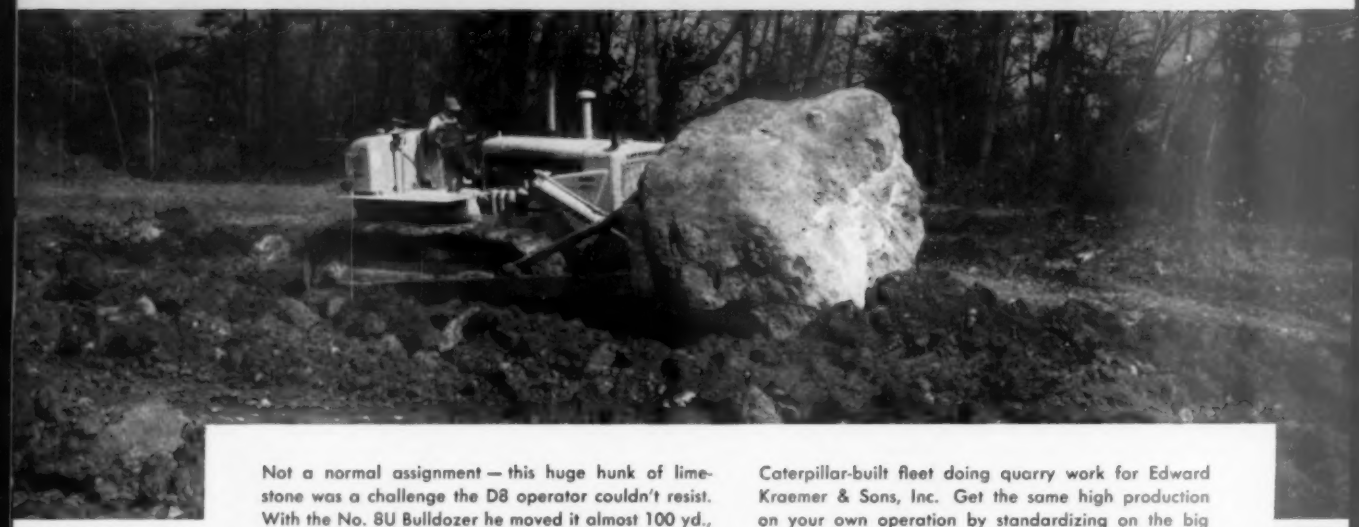
Lime on the menu

Transferring their discussions from meeting hall to luncheon table were these people attending the midyear meeting of National Agricultural Limestone Institute. Reading clockwise from lower left are Cecil Pottorf, Indian Point Limestone Products, Doyle-Pottorf, Mason City, Ill.; H. C. Wolfe, Wyandot Dolomite, Inc., Carey, Ohio; W. A. Canary, Footville Lime & Rock Co., Footville, Wis.; Paul Frank, Paul Frank, Inc., North Vernon, Ind.; Taisto Lane, Limestone Aggregates, Inc., Strasburg, Ohio; Mrs. Taisto Lane; Ralph Johnson, Simplicity Engineering Co., Durand, Mich.

To each his own

Eric V. Puckle, third from left, Australian gravel producer, charted his American tour around—you guessed it—gravel plants. Here the traveler enjoys a Western welcome from the staff of Rhodes and Jamieson Ltd., Oakland, Calif. From left are: J. R. Cassiday, plant manager at Centerville and Pleasanton, D. A. Gildersleeve, Centerville plant superintendent and (far right) Frank R. Piper, Pleasanton plant superintendent. Mr. Puckle is director, Emu & Prospect Gravel & Road Metal Co., Sydney

Want a 50% production increase?



Not a normal assignment — this huge hunk of limestone was a challenge the D8 operator couldn't resist. With the No. 8U Bulldozer he moved it almost 100 yd., then pushed it into the pit. The stone probably weighed as much as the D8. This machine is part of a large Caterpillar-built fleet doing quarry work for Edward Kraemer & Sons, Inc. Get the same high production on your own operation by standardizing on the big yellow machines. On normal assignments or not, they take the hard work in stride and make it look easy.

Caterpillar pioneered the revolutionary "U"-shaped bulldozer, the No. 8U, for use on the Cat D8 Tractor and the No. 9U for the D9.

With a "U"-shaped 'dozer blade, you get the shearing action of an angling blade plus the rolling action of a straight blade. The shearing action of the wing digs into the material, forcing it to the center of the blade where a capacity load is carried the full length of the 'dozing pass. "U"-shaped 'dozers can carry tremendous loads with very little spillage around the sides or over the top—so every pass is a full pass, and every full pass is a profitable pass. In fact, tests have shown you can expect to increase 'dozing production as much as 50% when you replace your conventional bulldozer with a Caterpillar "U"-blade.

Hard to believe? Your Caterpillar Dealer will prove it for you, with your own rock, gravel or earth. Call him and arrange a no-holds-barred demonstration.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

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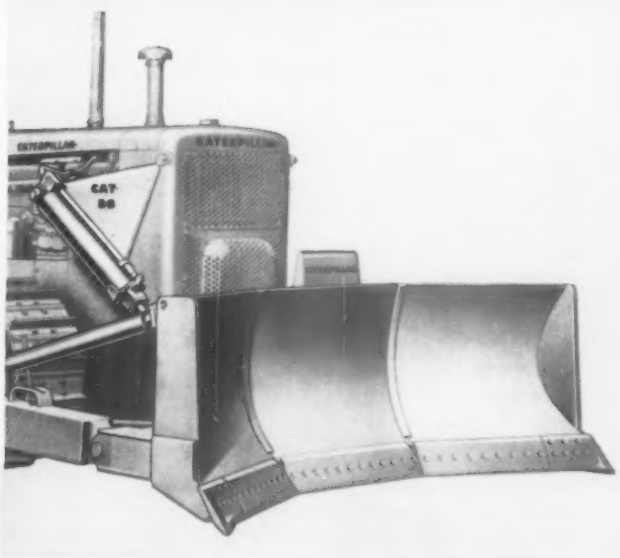
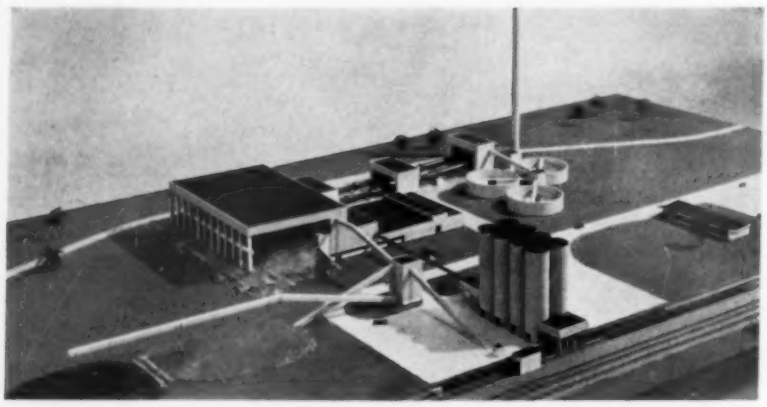
HIGH-PRODUCTION DOZING

Try a "U"-blade on your job!



"The hydraulic tilt cylinder on our D8's No. 8U Bulldozer makes loading much easier. By tilting the blade up and down while loading, it keeps the blade free and at the same time it loads the blade faster. It's handy for digging this tough clay. By using one corner, it breaks up the ground faster."—That's the on-the-job report of Vernon Hamburg, operator for Edward Kraemer & Sons, Inc., Plain, Wisconsin. Mr. Hamburg with his "U"-bladed D8 strips 900 to 1,000 yards of quarry overburden a day.

INDUSTRY NEWS



Two-kiln Dundee plant now under construction

THE DUNDEE CEMENT CO., Dundee, Mich., announces beginning of construction at its plant site 40 miles southwest of Detroit. Work started on the $25-million, 5-million-bbl. plant in June, and is expected to be completed by January 1, 1960. Material reserves of limestone and clay at the plant site are sufficient for 140 years of operation.

Shown in the model of the plant are the two 16½-15-16½ x 460 ft. rotary kilns, each with a capacity of 8,000 bbl. of clinker per day. Five grinding mills, 12 x 36 ft., are driven by 2,500-hp. motors. Two of these mills are working in series for raw grinding, and three in closed circuit for finish grinding. Other features are an overhead crane with 150-ft. span and 38 x 150-ft. cement silos. All the equipment will be bought in the U.S. The engineering department of St. Lawrence Cement Co. is responsible for design and construction of the plant, in cooperation with local consulting engineers.

National Gypsum begins asbestos production

NATIONAL GYPSUM CO., Buffalo, N.Y., opened its new asbestos mine and mill at Thetford Mines, Quebec, on July 7, climaxing five years of preparation. The parent company operates the new plant, known as National Asbestos Mines, Ltd., through its wholly owned Canadian subsidiary, National Gypsum Canada, Ltd. The new facility has a daily ore capacity of 3,000 tons and will produce 50,000 tons of asbestos fiber per year.

Melvin H. Baker, chairman of the board of National Gypsum, describing the ore body as "good quality," estimated its life at more than 70 years. The company expects to continue its present open pit mining operations for many years and then go to underground mining.

In the accompanying photo the mill forms the background as a miner prepares to drill at the edge of the mine.

The five-story mill building is the largest structure on the site; others include machine shop and garage, primary crusher building, secondary crusher and dryer building and office.

Phosphate development now a certainty

STAUFFER CHEMICAL CO., New York, N. Y., and its affiliate, San Francisco Chemical Co., Montpelier, Idaho, have announced that phosphate deposits near Vernal, Utah, will be developed in the near future (ROCK PRODUCTS, April, 1958, p. 37). The Uintah County Lode is amenable to open pit mining and can become the largest operation of its type in the western United States, according to the announcement. It is located along the Vernal-Manila highway, a few miles from the site of Flaming Gorge Dam.

Stauffer is moving into the elemental phosphorous field, it has been indicated. Substantial upgrading of the material will be made possible by a system of selective flotation. This would involve construction of a mill near Vernal. An initial production of about 2,000 tpd. is anticipated.

American-Marietta enters dyestuffs industry

AMERICAN-MARIETTA CO., Chicago, Ill., entered the dyestuffs industry with the acquisition of Southern Dyestuff Corp., Charlotte, N.C., producer of sulfur dyes. It was a $16-million transaction. The North Carolina company will continue operations as a division of American-Marietta.

Potash prices trimmed

POTASH CO. OF AMERICA, Carlsbad, N.M., reduced its prices July 1 from 6½ to 7 percent under the 1957-1958 marketing year's prices. The new schedule calls for prices to begin at 32 cents per unit for July and August shipments and to increase to 36½ cents per unit by January. An incentive discount, normally applicable on completion of a contract, has been applied on each invoice, it was announced.

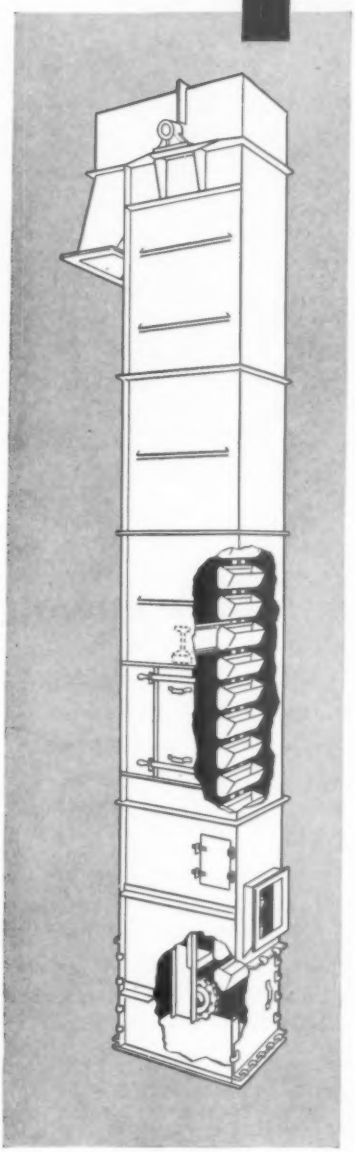
Potash prices are figured on a per-ton basis according to the amount of pure mineral it contains—a ton of potash containing 60-percent pure mineral would sell at the 32-cent rate for $19.20, or 60 multiplied by 32 cents.

(Continued on page 45)

SURPASSING TODAY'S NEEDS

the PLUS values in...

REX® CEMENT MILL BUCKET ELEVATORS



Here is a completely different concept of cement mill bucket elevators...the Rex Rated Line. These elevators provide the *plus values* you want...the most dependable, economical means of elevating bulk materials. They more than meet the exacting requirements of the cement industry for maximum service life... capacity...dependability. They're your best investment for profitable operations.

IN CAPACITY—These elevators match the capacity requirements of modern closed-circuit grinding systems. A hooded bucket and balanced chain design permits much closer spacing of buckets. Vented buckets make sure each bucket carries its full load. With these design features, Rex Centrifugal Discharge Elevators not only closely approach the capacity of super capacity elevators while retaining the advantage of economy...*they are ready for increased capacity demands tomorrow!*

IN DEPENDABILITY—The "balanced design" of all components assures longest possible, dependable service life. Chains are selected on dynamic working factors...the static live bearing pressures and fatigue strengths...rather than static ultimate strengths. They're balanced with bucket sizes, speeds and center distances. Chains are designed so they will never break. Down time is never a problem.

IN ECONOMY—Rex "balanced design" assures long-life dependability at lowest cost...both first and operating. These elevators pay for themselves. Costly down time and production hold-ups of ordinary elevators are virtually eliminated. And since all sizes are "rated" for capacity and operating requirements, you can easily select the one best suited for your needs.

With a complete line of bucket elevators...the acknowledged leader in elevator design, CHAIN Belt, offers you the *plus values* that make your elevator dollar buy more than ever before possible. For complete information, send for your copy of Bulletin No. 3304. Or, if you're interested in elevator components...chains, buckets, bearings, etc....turn the page.

CHAIN BELT

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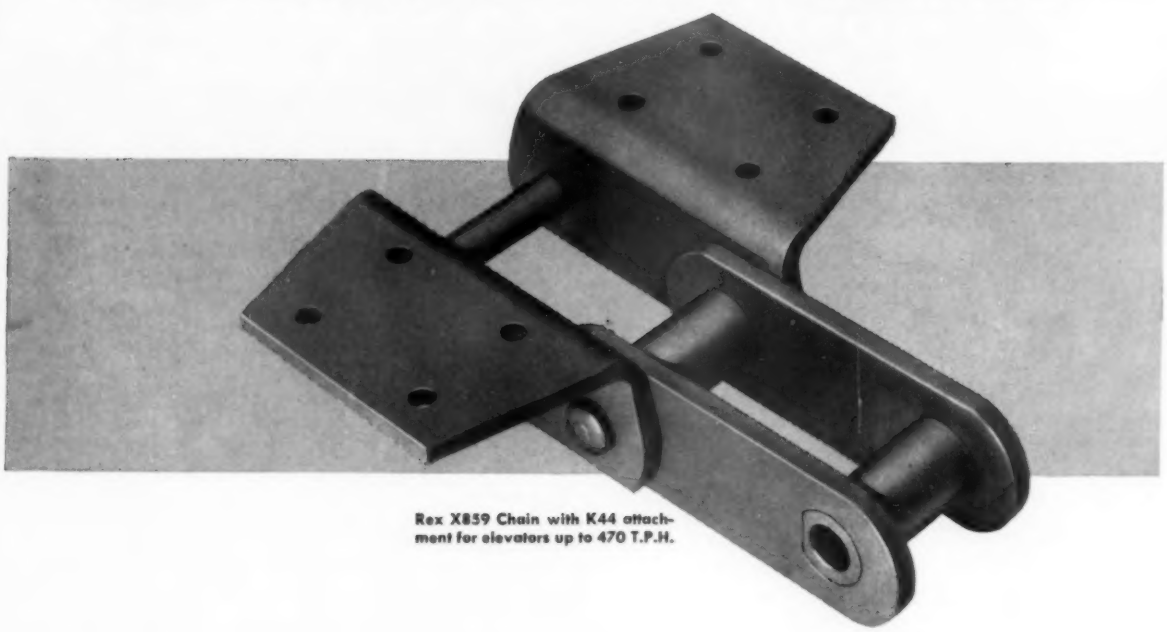
the PLUS values in...

REX CHABELCO® ELEVATOR CHAINS



Rex X839 Chain with K44 attachment for elevators up to 470 T.P.H.

DESIGNED FOR DEPENDABLE WEAR LIFE...NEVER BREAK!

These precision-made steel chains are designed to provide the longest possible service life. Only after they have more than earned their keep through long, economical service will they finally wear out. Their extra working strength enables them to handle larger, more fully loaded buckets with ease. Look at what these chains will do for you:

- Lift cement, clinker and stone day after day, year after year, because the large-diameter pins in the extra-wide chains provide unsurpassed "wearability" ...low unit bearing pressures in the chain joint.
- The buckets will never come off...no matter how big and wide...because the chain attachment is extra large with large-sized bolts. The buckets are always tight no matter what the operating conditions.
- The chains will never come apart because all parts are precision-made and forced together...permanently.
- The chains will never break because they are scientifically designed...extra strength where strength is needed...stress-concentration areas eliminated.
- The wheels will match the chain for "wearability" because they are "deep-hardened" and smooth in operation.

For complete information on elevator chains and components, send for your copy of Bulletin No. 5766.

CHAIN BELT

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CHABELCO CHAINS • ROLLER CHAINS • CAST CHAINS • SPROCKETS • FLEXIBLE COUPLINGS • SET COLLARS

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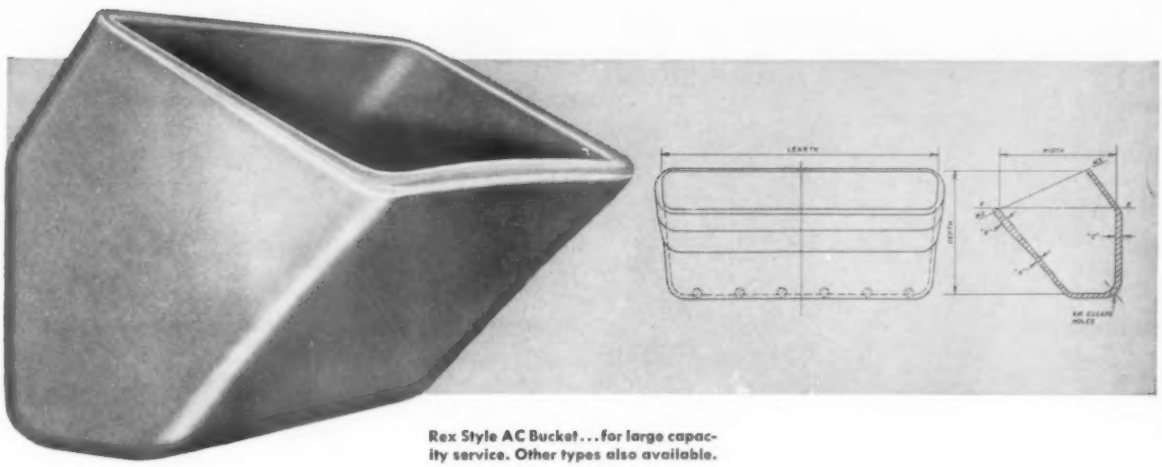
the PLUS values in...

REX® STYLE AC ELEVATOR BUCKETS



Rex Style AC Bucket...for large capacity service. Other types also available.

HOLES IN THIS BUCKET KEEP IT FULL...

Rex Style AC, a new concept in cement mill elevator buckets, assures full capacity at all times and a smooth, fast, clean discharge. Unique air vents in the bottom of the bucket, by allowing displacement of air, prevent trapping or pocketing of air when loading...act as a relief valve to prevent suction when unloading. The results: faster loading...fuller loading...fast, clean discharge, particularly with the fine mesh materials.

On the Style AC bucket, the hooded back makes continuous spacing of the buckets on the chain practical because the entire bucket load is thrown clear of the bucket line. The high front gives you a bigger bucket load...highest water level capacity for the fine mesh materials.

For smaller capacity bucket elevators, CHAIN Belt also makes a complete line of rugged, long-life buckets in conventional types: Styles A, AA and AARB. All Rex Elevator Buckets are accurately cast in Rex Quality Malleable Iron or in Rex Z-Metal where maximum strength and wear life are required. They have strong, heavy walls...no weak or thin spots. They are straight, clean and smooth for fast discharge. Special steel-fabricated buckets are also available.

SALES OFFICES: Appleton, Wis.; Atlanta, Ga.; Baltimore, Md.; Birmingham, Ala.; Boston, Mass.; Buffalo, N.Y.; Charlotte, N.C.; Chicago, Ill.; Cincinnati, Ohio; Cleveland, Ohio; Dallas, Tex.; Denver, Colo.; Detroit, Mich.; East Orange, N.J.; Grand Rapids, Mich.; Houston, Tex.; Jacksonville, Fla.; Kansas City, Mo.; Los Angeles, Cal.; Milwaukee, Wis.; Minneapolis, Minn.; Moline, Ill.; Montreal, Can.; New York, N.Y.; Odessa, Tex.; Oklahoma City, Okla.; Philadelphia, Pa.; Pittsburgh, Pa.; Portland, Ore.; St. Louis, Mo.; Salt Lake City, Utah; San Francisco, Cal.; Seattle, Wash.; Springfield, Mass.; Toronto, Can.

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ELEVATOR BUCKETS • TRACTION WHEELS • INTERNAL GRAVITY TAKE-UPS • DRAG CHAINS • BELT IDLERS

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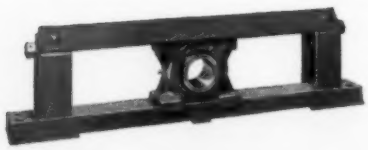
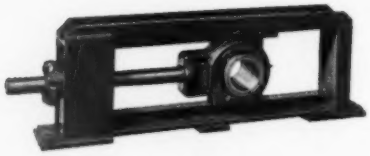
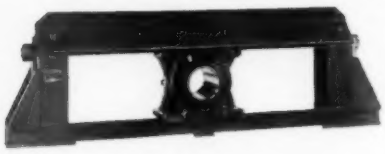
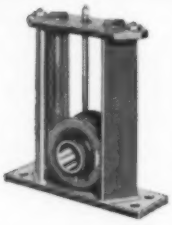
the PLUS values in... SHAFER® ROLLER BEARINGS









CONSTANT CAPACITY UNDER ANY LOAD

The unique Shafer Bearing design combines the advantages of the low rolling friction of a ball with the high load-carrying capacity of a roller. And this capacity is constant *regardless of load*... radial, thrust or combined. The combination of concave rollers working between convex raceways distributes the load equally over a maximum contact area. Regardless of load or shaft deflection, there is always more-than-ample contact area... actually reserve capacity to handle heavy shock loads.

Shafer Bearing design provides a high degree of integral self-alignment... 3° total between mounting and shaft... assuring unrestricted compensation for misalignment, shaft deflections, shock loads or installation inaccuracies.

The housing is not bulky or heavy and yet is unusually strong... resists the heavy shock loads of cement mill elevator service. Built-in Micro-Lock provides 12 easy bearing adjustments. "Z" housing seal is a true self-aligning seal... effectively prevents dirt and dust from entering... keeps lubricant in!

For the complete story on Shafer Self-Aligning Roller Bearings... pillow blocks, take-ups, cartridge units, flange units... write for your copy of Catalog No. 55.

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PILLOW BLOCKS • TAKE-UPS • FLANGE UNITS • DUPLEX UNITS • TAKE-UP AND FRAME UNITS • CARTRIDGE UNITS

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(Continued from page 40)

There's plenty of interest at mining show

"A STRONG CONVENTION PROGRAM covering topics of major interest to the industry"—this is the description by Julian D. Conover, executive vice president, of the upcoming 1958 Mining Show of American Mining Congress. Delegates will converge upon San Francisco for the show, to be held in the civic center exhibit hall and auditorium September 22-25. Most of them are expected to arrive Sunday, September 21, in time for a reception and cocktail party and stay over for field trips Friday, September 26.

From Sunday until Friday evening, the jam-packed program will provide events competing for delegates' time. The exposition of mining equipment will completely fill the new exhibit hall, the main section of the auditorium and a large outside area. To allow more time for inspection of the exhibits, the number of convention sessions has been limited to 19 as compared with 25 in 1954.

In the mining show, the producer is given an opportunity to keep abreast with latest developments, not only in metal mining, but in the industrial minerals fields. Discussions will relate to national mineral policies, labor relations, taxation and public lands, with government officials and mining leaders taking part. Technological advances in underground and open-pit mining, minerals beneficiation, exploration, health and safety, etc., will be given by engineers and operating men.

Of particular interest to the producer of nonmetallic minerals will be a Thursday morning session on industrial minerals, with C. E. Wuerpel, Marquette Cement Manufacturing Co. vice president, serving as chairman. Speakers and their topics will be: C. M. (Max) Gilliss, director of public works, California Department of Public Works, Sacramento, "Raw Material Requirements for the Federal Road Program;" Gordon Barr, production engineer, Southwestern Portland Cement Co., "Application of Silicone Treated Glass Bags for Collecting Dust in Hot Gases;" and James C. Hicks, research director, Chemical Division, Kaiser Aluminum & Chemical Corp., "Use of Industrial Minerals in Basic Refractories." Thomas Ware, president of International Minerals & Chemical Corp., will take part in a session on management problems. Subject of his talk: "The Role of Engineering in Management."

There are other well-known figures in the rock products field participating in the convention program. Among them are Lewis J. Patterson, manager of the northern district, Michigan Limestone Division of U. S. Steel Corp. He will take part in a symposium on ammonium nitrate blasting at a session on open-pit mining. At another open-pit mining session, Victor I. Mann, vice president, Lake Asbestos of Quebec, Ltd., will talk about progress at the Black Lake Asbestos project and Lewis A. Parsons, consulting engineer at Calaveras Cement Co., will explore the subject, "Modern Open-Pit Methods and Equipment." A paper on boron will be given at one of the sessions by J. Frederick Corkill, vice president and general manager of Pacific Coast Borax Co. Division of U. S. Borax & Chemical Corp.

Appearing at sessions devoted to underground mining will be Russell G. Haworth, vice president in charge of production, Potash Co. of America, and John H. Baker, superintendent of American Gilsonite Co. Mr. Haworth will speak about freezing operations for shaft sinking in Saskatchewan, and Mr. Baker, about mining by hydraulic jet. Hydraulic filling in underground mines will be the topic developed by Richard M. Stewart, assistant to the director of mining research, The Anaconda Co.

Mining and metallurgy sessions will feature, among others: R. T. Lassiter, district manager of Western-Knapp Engineering Co., speaking on new trends in plant design; Harlow Hardinge, president of Hardinge Co., Inc., autogenous grinding; and Robert B. Thompson, Filter Division, The Eimco Corp., improvements in filtration. Other subjects brought up at these sessions will be new developments of the gyratory ball mill, scientific principles of the flow of crushed material and practicality of present day automation.

Special events on the convention calendar feature a field trip Friday, September 26, to the 8,500,000-bbl. cement plant of Permanente Cement Co. south of the San Francisco peninsula and on to the Ford Motor Co. assembly plant at Milpitas. Another outing on the same day will take visitors to Stanford Research Institute, Hewlett-Packard Co.'s electronic instruments plant and the publishing plant of Sunset Magazine.

Entertainment includes the Miners Jamboree Tuesday night and the AMC

(Continued on page 50)

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CONCRETE SILO
STORAGE SYSTEMS
can really take it!

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HEAVY LOAD STORAGE Rugged Marietta concrete silos save on storage space . . . keep materials off the ground. Heavy stone or lumps of the largest diameters can be safely and efficiently stored and handled.

CONSTANT SHOCK RESISTANCE Extra strength built into Marietta concrete storage silos resists constant punishment of loading and unloading heavy bulk materials.

WEAR-RESISTANT INTERIOR Hard concrete surface resists abrasive wear or corrosion damage. A trowelled-on plaster coating provides extra smooth surface for delicate materials.

LASTING PROTECTION Marietta solid concrete stave construction protects materials against weather and fire damage. Air-cell staves provide additional insulation protection against freezing and condensation.

Save time, money and materials with a complete Marietta storage system, including conveying, feeding and discharge equipment designed to your need.

Marietta will do the job under one cost-saving contract or will cooperate with your engineering staff, consultants or contractor.

Write for a copy of Marietta's Modern Industrial Storage Systems booklet illustrating the rugged construction and diversified applications of Marietta concrete storage silos.

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AT CONSUMER COMPANY'S QUARRY

P&H ELECTRICS P

In the 100-ft. deep mammoth Consumer Company limestone quarry in McCook, Illinois, this 5 cu. yd. P&H Electric Shovel is proving to be a vital link in the production of crushed stone. Biting into the 50 ft. face, this P&H Model 1500 loads a steady string of 5-ton trucks to keep crushers operating 'round-the-clock.

This maximum availability coupled with a minimum of maintenance is typical of P&H performance in important mines and quarries throughout the world. That's why leading operators are choosing P&H Electrics for both new installations and replacements.

Comparison tests have proved that two exclusive P&H features pay off in *continuous profitable production:*

MAGNETORQUE,® the electro-magnetic type coupling that transmits power from hoist motor to dipper for faster action, eliminating shock and impact to the hoist gear train and motor.

ELECTRONIC CONTROLS, the fastest acting type of control available on electric shovels, providing the smoothest, quickest production cycle known.

With P&H you get single source responsibility . . . another distinct advantage experienced only by users of P&H Electric Shovels. P&H designs, manufactures and applies all electric rotating equipment specifically for electric shovel service.

P&H DIESEL ELECTRIC: 4½ cu. yd. capacity
P&H ELECTRIC SHOVEL LINE: 3½ through 10 cu. yd. capacities

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Construction & Mining Division
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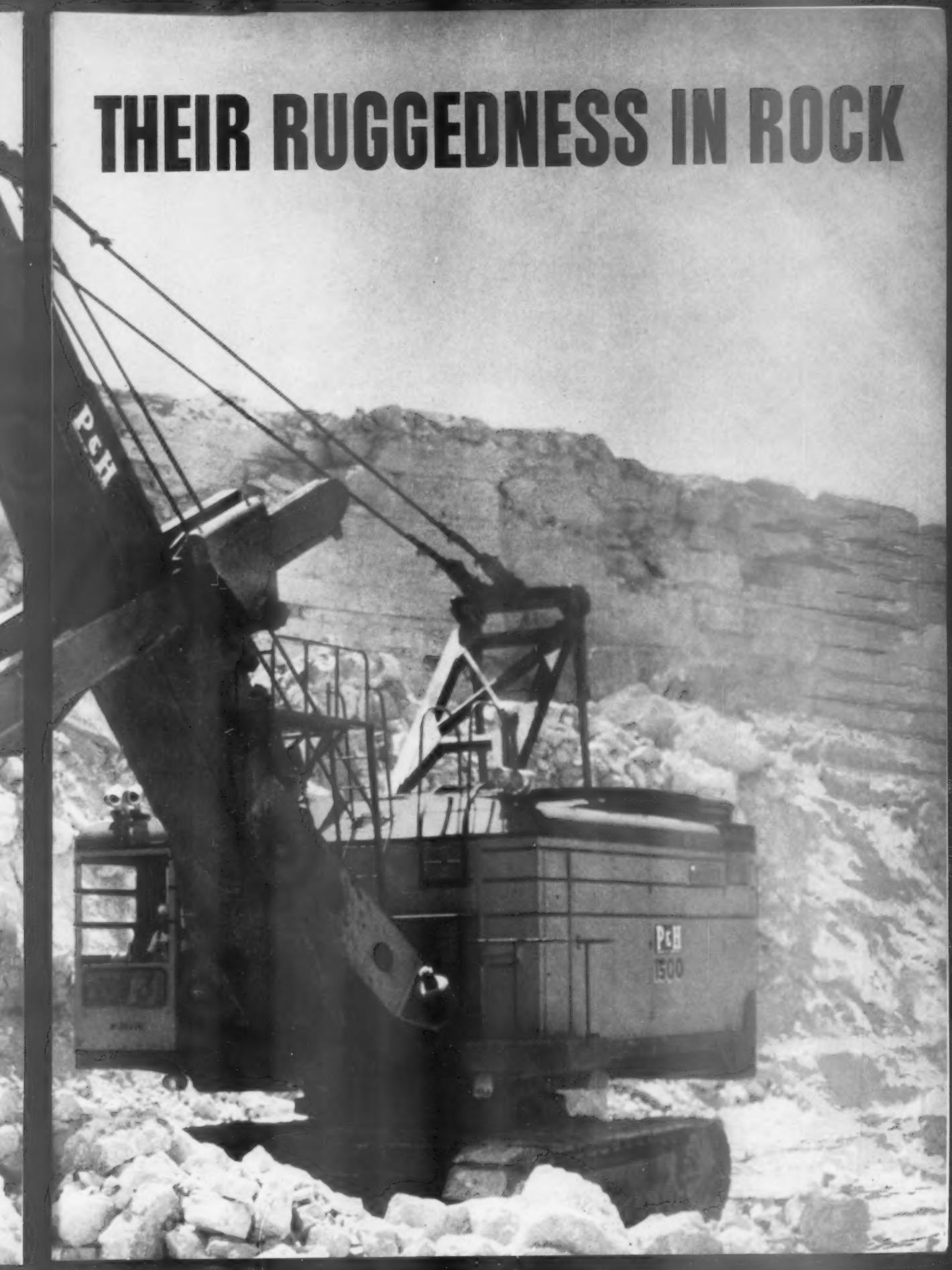
THEIR RUGGEDNESS IN ROCK



Make more profit on the jobs ahead...

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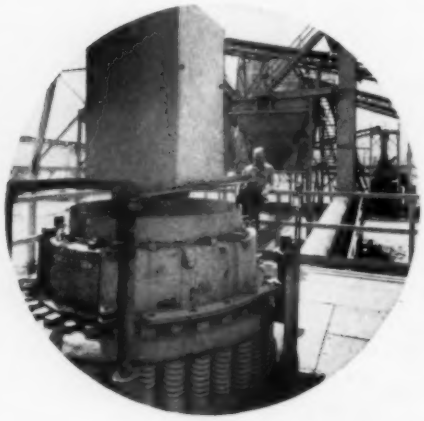
Here is a dramatic example of the vast contributions to the progress of mankind being made by the construction industry. In modern engineering and huge construction projects such as this, specification aggregate has assumed an increasingly important role. To meet the constantly growing demand for vast tonnages of quality aggregate used in concrete and bituminous highways, Symons Cone Crushers are today, more so than ever before, the first choice of leading producers throughout the world. Symons Cone Crushers are also used in sand preparation operations.

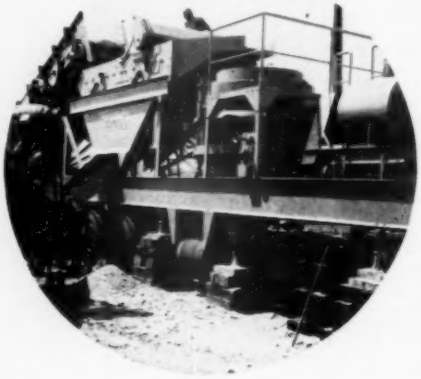
For in aggregate and sand production . . . *as in all of the great ore and industrial minerals operations the world over* . . . no record equals the performance of Symons Cone Crushers that have so consistently produced, economically and efficiently, great quantities of finely crushed product resulting in higher profit per ton per hour.

Before you submit *your* next bid, get full information about Symons Crushers.



FOR STATIONARY PLANTS

Symons Cone Crushers are the choice of leading contractors and producers for primary, secondary and finer reductions in all types of aggregate operations. Available in both Standard and Short Head types, Symons Cones are built in sizes from 22" to 7' in diameter, for capacities from 6 to 900 or more tons per hour.



FOR PORTABLE PLANTS

Symons Cone Crushers are being used in increasing numbers for portable and semi-portable crushing plants. Illustrated is a typical Cedarapids Intermediate Scalping Unit, using a 4-ft. Symons Cone Crusher. Unit is serving a large Midwest sand and gravel producer.

SYMONS . . . a registered Nordberg trademark known throughout the world.

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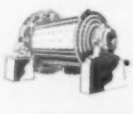
SYMONS PRIMARY GYRATORY CRUSHERS

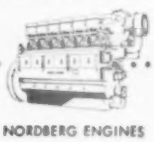


NORDBERG GRINDING MILLS

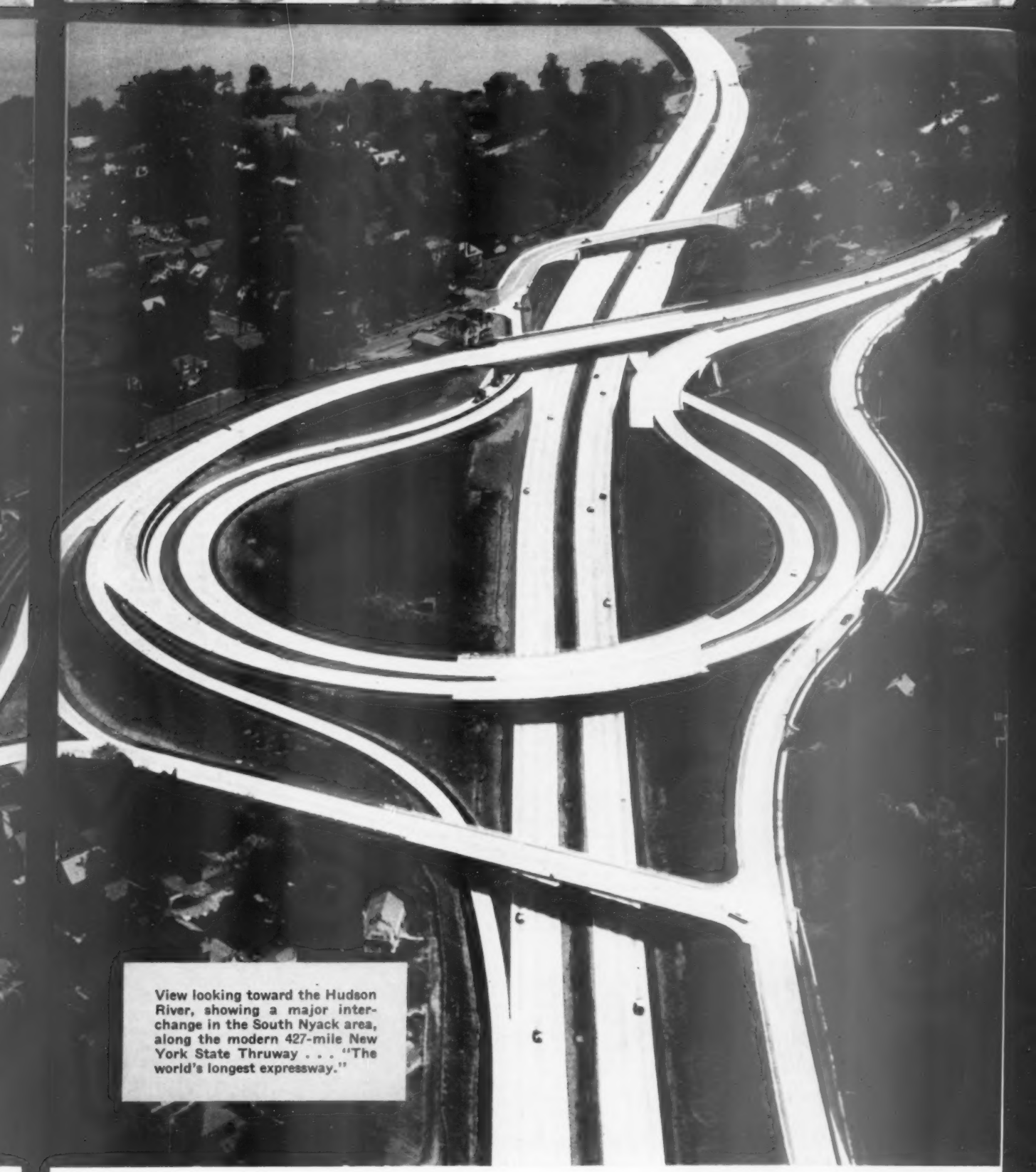
SYMONS VIBRATING GRIZZLIES

SYMONS VIBRATING SCREENS

ROTARY KILNS and COOLERS



NORDBERG ENGINES



View looking toward the Hudson River, showing a major interchange in the South Nyack area, along the modern 427-mile New York State Thruway . . . "The world's longest expressway."

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Makes 2 to 7 separations simultaneously in five minutes or less per complete test. Size range: 4-inch to 200 mesh. Sand Attachment optional for handling 8-inch sieves.

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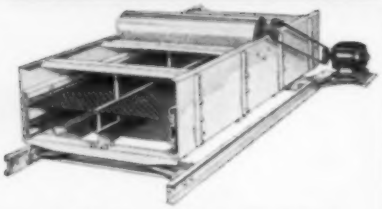

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INDUSTRY NEWS

(Continued from page 45)

dinner dance on Thursday. The Strategic Minerals Luncheon has been scheduled for Wednesday noon. For the ladies, special events include a tea Monday afternoon, an East Bay trip and luncheon on Tuesday and a luncheon and fashion show on Wednesday.

Here are exhibitors at Mining Congress

Acme Hamilton Mfg. Corp., Acme Pacific Division • Aeroquip Corp., Western Division • Aero Service Corp. • Allen-Sherman-Hoff Pump Co. • Allis-Chalmers Mfg. Co., Construction Machinery Division • Alloy Steel & Metals Co. • American Air Filter Co., Inc. • American Brattice Cloth Corp. • American Cyanamid Co. • American Manganese Steel Division, American Brake Shoe Co. • American Mine Door Co. • Atlas Copco Pacific, Inc. • Atlas Powder Co. • Austin-Western, Construction Equipment Div., Baldwin-Lima-Hamilton Corp. • Baldwin-Lima-Hamilton Corp., Construction Equipment Division • Band-It Company • Barber-Greene Co. • Barrett, Haentjens & Co. • Bemis Bro. Bag Co. • Bendix Aviation Corp. • Bethlehem Pacific Coast Steel Corp. • Bixby-Zimmer Engineering Co. • Boston Woven Hose & Rubber Co., Div. of American Biltrite Rubber Co., Inc. • Boyles Bros. Drilling Co., Ltd. • Broderick & Bascom Rope Co. • Brown, Inc., David • Brunner & Lay Rock Bit Corp. • Bucyrus-Erie Co. • Buell Engineering Company, Inc. • Bush Engineering & Mfg. Co. • C & D Batteries, Inc. • Card Iron Works Co., C. S. • Caterpillar Tractor Co. • Chicago Pneumatic Tool Co. • Christensen Diamond Products Co. • Clark Equipment Co., Construction Machinery Division • Coast Mfg. & Supply Co. • Colorado Fuel & Iron Corp. • Connellsville Mfg. & Mine Supply Co. • Continental Motors Corp. • Contract Engineering Co. • Crucible Steel Co. of America • Cummins Engine Co., Inc. • Curtiss-Wright Corporation, South Bend Division • Denver Equipment Co. • Derrick Mfg. Co. • Detroit Diesel Engine Division, General Motors Corp. • Diamond Iron Works Division, Goodman Manufacturing Co. • Diamond Tool Research Co., Inc. • Dow Chemical Co. • Du Pont de Nemours & Co., Inc., E. I. • Eimco Corporation • Electric Steel Foundry Co. • Electric Storage Battery Co., Exide Industrial Division • Engineering & Mining Journal • Equipment Engineers Inc. • Euclid Division, General Motors Corp. • Fairchild Aerial Surveys, Inc. • Firth Sterling Inc. • Flexible Steel Lacing Co. • Galigher Co. • Gardner-Denver Co. • Gates Rubber Co. • General Cable Corp. • General Electric Co., Apparatus Sales Division • Goodman Mfg. Co. • Goodrich Industrial Products Co., B. F. • Gould-National Batteries, Inc., Industrial Division • Griphoist, Inc. • H & L Tooth Co. • Hardinge Co., Inc. • Harnischfeger Corp. • Hawthorne, Inc., Herb J. • Hercules Motors Corp. • Hercules Powder Co. • Hewitt-Robins • Hughes Tool Co. • Humphreys Engineering Co. • Industrial Nucleonics Corp. • Industrial Physics & Electronics Co. • Ingersoll-Rand Co. • International Harvester Co. • International Nickel Co., Inc. • Iowa Mfg. Co. • Jaeger Machine Co. • Jeffrey Mfg. Co. • Johnson-March Corp. • Joy Mfg. Co. • KW-Dart Truck Co. • Kennametal Inc. • Koehring Company, Koehring Division • Le Roi Division, Westinghouse Air Brake Co. • Leschen Wire Rope Division, H. K. Porter Co., Inc. • LeTourneau, Inc., R. G. • LeTourneau-Westinghouse Co. • Link-Belt Co. • Longyear Co., E. J. • Los Angeles By-Products Co. • Los Angeles Steel Casting Co. • Ludlow-Saylor Wire Cloth Co. • Machinery Center, Inc. • Mack Trucks, Inc. • Macwhyte Wire Rope Co. • Mancha Storage Battery Locomotive Division, Goodman Manufacturing Co. • Manning Co., Charles E. • Marion Power Shovel Co. • Mine Safety Appliances Co. • Mining Congress Journal • Mining World • Mission Mfg. Co. • Mobile Drilling, Inc. • Nagle Pumps, Inc. • National Filter Media Corp., Western Division • National Malleable & Steel Castings Co. • National Supply Co. • Nordberg Mfg. Co. • Northwest Engineering Co. • Ohio Brass Co. • Olin Mathieson Chemical Corp., Explosives Division • Ore & Chemical Corp. • Pioneer Engineering, Division of Poor & Co. • Pit & Quarry Publications • Plastic Wire & Cable Co. • Plummer Co., Walter A. • Porter Co., Inc., H. K. • Productive Equipment Corp. • Quaker Rubber Division, H. K. Porter Co., Inc. • Raybestos-Manhattan, Inc. • Red Jacket Co., Inc. • Reich Bros. Mfg. Co., Inc. • Ridge Tool Co. • Rock Products Magazine • Roebling's Sons Corp., John A. • Rust-Oleum Corp. • Sanford-Day Iron Works, Inc. • Sika Chemical Corp. • Simplex Wire & Cable Co. • Skookum Co., Inc. • Smidth & Co., F. L. • Southwestern Engineering Co. • Spencer Chemical Co. • Standard Steel Corp. • Stearns Magnetic Products • Stephens-Adamson Mfg. Co. • Stoody Company • Stratoflex, Inc. • Thermoid Co. • Thomas Flexible Coupling Co. • Thor Power Tool Co. • Timken Roller Bearing Co. • Tool Steel Gear & Pinion Co. • Traylor Engineering & Mfg. Co. • Twin Disc Clutch Co. • Tyler Co., The W. S. • Union Wire Rope Corp. • United States Rubber Co. • United States Steel Corp. • Universal Engineering Corp. • Varel Mfg. Co. • Vascoloy-Ramet Corp. • Victaulic, Inc. • Vulcan Iron Works Co. • Wedge Wire Corp. • Western Gear Corp. • Western Insulated Wire Co. • Western Machinery Co. • Western Rock Bit Mfg. Co. • Westinghouse Electric Corp. • Wheelabrator Corp. • White Motor Co. • Wild Heerbrugg Instruments, Inc. • Willys Motors, Inc. • Wooldridge Mfg. Div., Continental Copper & Steel Industries, Inc. • Yuba Consolidated Industries, Inc.

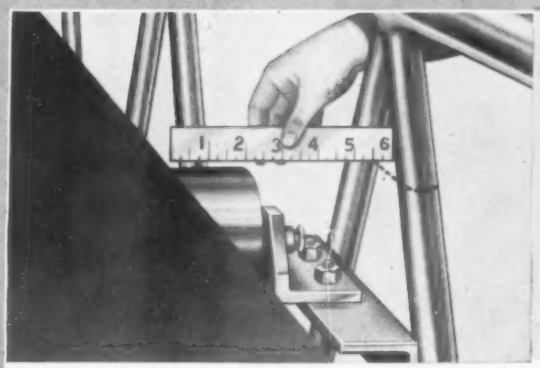
Barrett Division opens gypsum board plant

BARRETT DIVISION of Allied Chemical Corp. opened a gypsum board plant in mid-July in Edgewater, N.J. Only 14 men are needed in the production line at the fully automated plant, which has an annual capacity of 250 million sq. ft. The plant is Barrett's first venture in gypsum, and according to H. Dorn Stewart, president, Barrett Division is studying the possibility of building other gypsum board plants in fast-growing population areas. Mr. Stewart predicted that nearly 9 billion sq. ft. of gypsum board will be produced annually for the home building industry by 1965. Production in 1957 totaled 6.66 billion sq. ft.

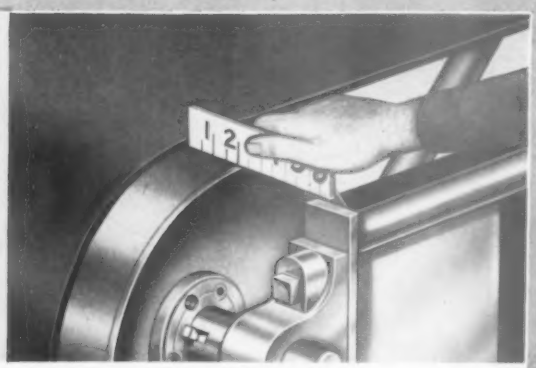
(Continued on page 55)

REDUCE BELT COSTS WITH MARCO TUBULAR FRAME CONVEYORS

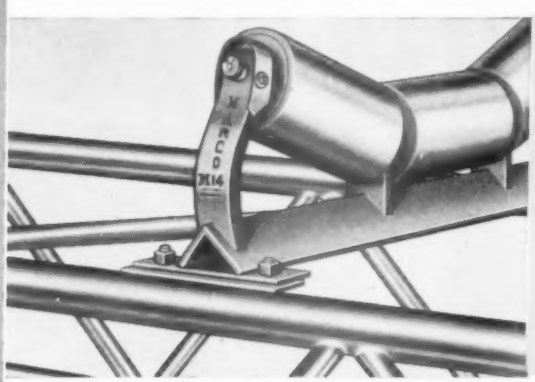
Exclusive conveyor features increase belt life by offering maximum protection against edge damage



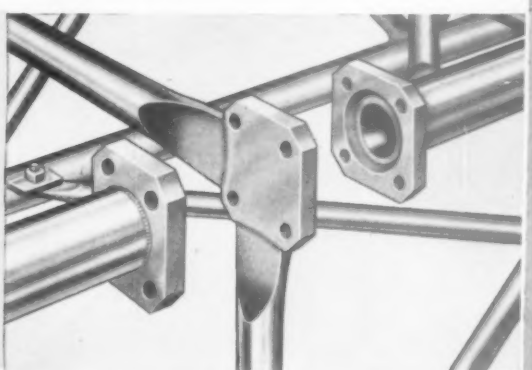
WIDER FRAME—MARCO Tubular Frames are widest in the industry. They provide 100% more space (5½") in the critical area—between belt edge and nearest frame member. Pedestal type return idler brackets are used, instead of hanger brackets that confine and damage belt.



WIDER FACE PULLEYS—MARCO is first with modern pulley specifications. 2" between belt and pulley edge—provides 100% greater protection than outmoded standards. Reduces possibility of belt destruction caused by "belt wandering" in high tension areas.



ALL TUBULAR MEMBERS—MARCO Tubular Frames are more rigid. Constructed of the strongest known structural member, these frames are modern—and resist material and water build-up. Sharp "belt cutting" edges are eliminated with this exclusive construction.



RIGID JOINT CONSTRUCTION—Another MARCO exclusive—4 bolts in each connection—16 in each joint. Not the usual 1 or 2 per connection. Joints are more rigid. Resists frame misalignment, simplifying belt training and increasing belt life.

Now, more than ever, conveyor belt represents the largest major repair or replacement expense in a conveyor installation. Realizing the extreme importance of this fact, MARCO has designed every conceivable belt saving idea into its Tubular Frame Conveyors.

MARCO is first to have all 4 of these proven belt protection features: a wider frame, wider face pulleys, all tubular members and the most rigid joint construction.

If wind, uneven loading, or factors beyond control should cause "belt-wandering", this exclusive conveyor design offers the operator the finest, most complete protection against belt "edge damage".

Increasing belt life by reducing belt "edge damage" is only one of the cost saving advantages in MARCO Tubular Frame Conveyors. Remember, your conveyors are not mere plant accessories—they deserve the attention of a specialized manufacturer offering modern specifications, carefully and properly designed to meet your most exacting requirements. For more information consult your MARCO Distributor or contact E. F. Marsh Engineering Co., St. Louis 10, Missouri.

*Trademark Reg.

MARCO*

engineered MARCO products:

Tubular Frame Belt Conveyors · Conveyor Idlers · Solid and Self Cleaning Steel Pulleys · Bucket Elevators · Control Gates · Feeders · Bins

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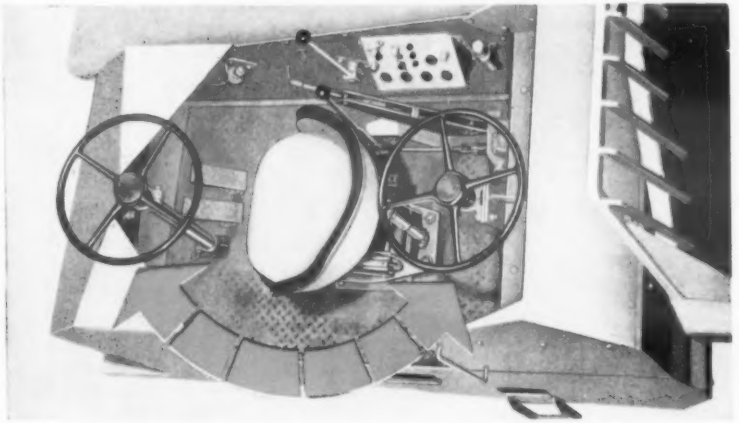
Now . . . a 10-YARD Dumptor®

Meet the newest addition to Koehring® heavy-duty line . . . big 10-cu. yd. model 100 Dumptor with 30,000-pound payload capacity . . . 168 h.p. diesel engine . . . torque-converter drive . . . power steering.

PIVOTING SEAT... TWO-WAY CONTROLS...

for *no-turn* shuttle hauling



Operator always faces direction of travel . . . swings around *without leaving seat.* Pivoting seat with 2-way Dumptor controls let him operate with equal ease, comfort and safety in either direction.

- ***Here's a quick "preview" of new 10-yard Dumptor:***
- **Dual steering wheels, throttle, brake pedals located at both operating positions of pivoting seat.**
- **Directional travel and speed-range lever, and dump controls, centrally-located for 2-way operation.**
- **Constant-mesh transmission hydraulic clutches give full range of speeds up to 20 m.p.h. in either direction.**
- **Smooth torque-converter drive . . . power steering . . . big, safe, 4-wheel airbrakes, plus parking brake.**
- **2 ways to dump — *instantaneous*, with gravity . . . or *controlled*, with hydraulic cylinders.**
- **All-welded, multiple-ribbed body with rock-guards . . . bolted or free-swinging "kick-out" pan.**
- **Oscillating steering axle, center-pivot-mounted . . . heavy welded one-piece wishbone frame.**
- **Big drive tires eliminate need for springs on drive axle . . . *no spring maintenance.***

2 SIZES — In addition to this new 10-yard, Koehring also builds a smaller, companion-model 6-yard Dumptor. Both offer cost-cutting advantages you can't afford to miss. Why not call your Koehring distributor about them or write to us for information, today?

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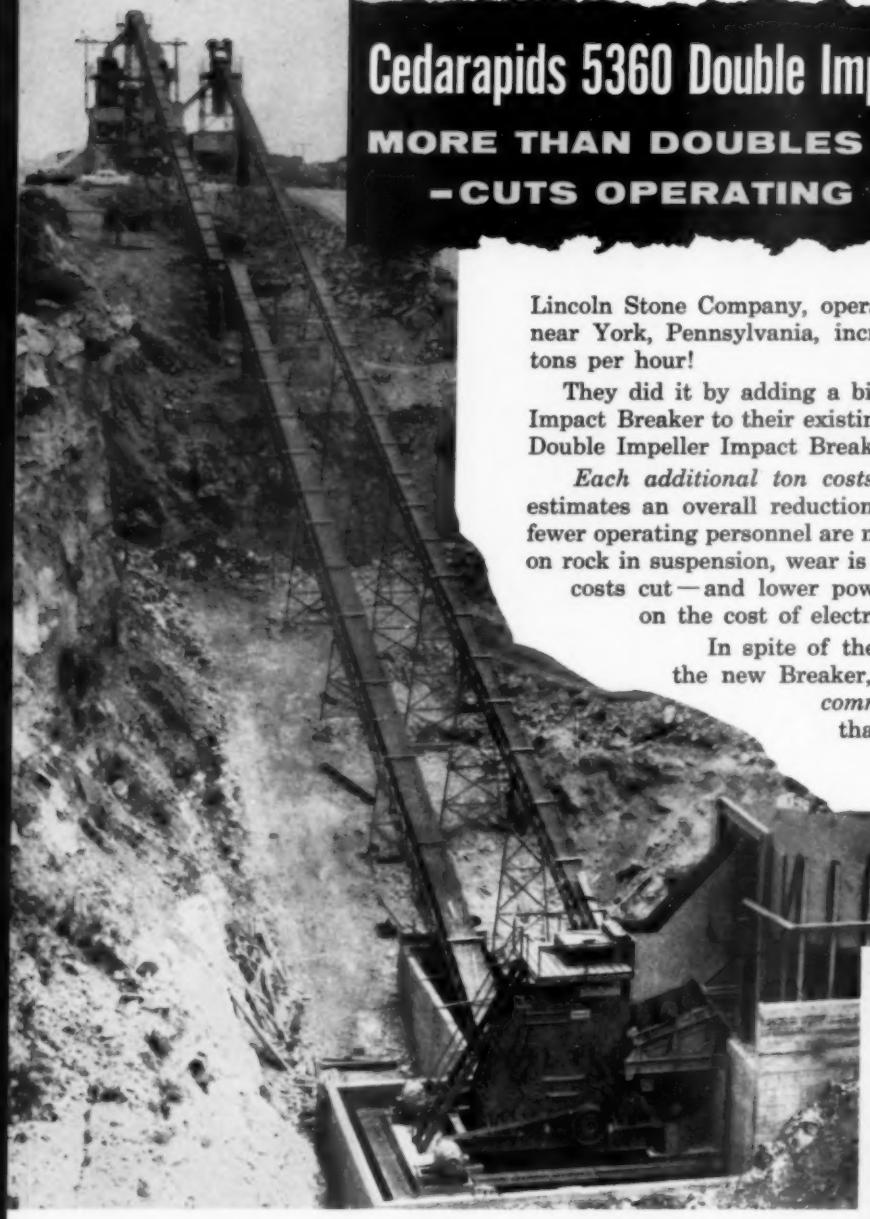
EXCAVATORS • CRANES • DUMPTORS • *twinbatch*® PAVERS • CONCRETE FINISHERS • MUD-JACK®

Cedarapids 5360 Double Impeller Impact Breaker

MORE THAN DOUBLES PLANT CAPACITY –CUTS OPERATING COSTS BY 25%



Lincoln Stone Company, operating this 100% Cedarapids plant near York, Pennsylvania, increased capacity from 400 to 1000 tons per hour!

They did it by adding a big Cedarapids 5360 Double Impeller Impact Breaker to their existing plant, which consisted of a 4350 Double Impeller Impact Breaker followed by two Hammermills.

Each additional ton costs less to produce! Lincoln Stone estimates an overall reduction in operating expenses of 25% — fewer operating personnel are needed — with 50% of rock breaking on rock in suspension, wear is sharply reduced and maintenance costs cut — and lower power consumption saves 7¢ per ton on the cost of electricity.

In spite of the increased capital investment for the new Breaker, *Lincoln Stone can now produce commercial stone for at least ⅓ less* than local competition using different make crushers!

1000 Tons Per Hour? —1250? —1500?

"We can't feed this Breaker fast enough to find out what its capacity really is," says owner WALTER SIPE

Although Lincoln Stone doesn't know the actual capacity of their big new Breaker (it has been averaging between 900 and 1000 tph, 85% minus 5" stone), *they do know that their Cedarapids engineered plant is production-balanced* for big tonnages. Each Cedarapids unit—Breakers, Vibrating Grizzly, Hammermills, Screens, Conveyors—is in proper balance with the others in both size and capacity.

You can profit by the experiences of other Cedarapids owners. Your Cedarapids Dealer is well-qualified to help you combine expert engineering with the most productive equipment for your job. Call him today!

Production-balanced with the other units in the plant, two Cedarapids 5′ x 16′ triple deck Horizontal Vibrating Screens easily handle the big tonnages from the main plant conveyor.

Cedarapids Built by IOWA

IOWA MANUFACTURING COMPANY

Cedar Rapids, Iowa, U.S.A.

INDUSTRY NEWS

(Continued from page 50)

Bauxite storage building has aluminum covering

KAISER ALUMINUM & CHEMICAL CORP., Oakland, Calif., used 235,000 sq. ft. of corrugated aluminum box ribbed siding and roofing sheet to cover this bauxite storage building at its new Gramercy, La., plant. The construction is intended to demonstrate maintenance saving advantages of the aluminum roofing and siding.

Designed by Kaiser Engineers, the building has semicircular ends and sloped sides and roof to conform to the shape of the storage pile. These provisions for maximum use of space make it possible to store up to 132,000 tons of bauxite ore.

Resistance to corrosion is one of the maintenance savings advantages of the aluminum structure pointed out by Kaiser, and other provisions to reduce maintenance include elimination of light trusswork and laced members from the structural frame. Stiffeners on main members were reduced to a minimum.

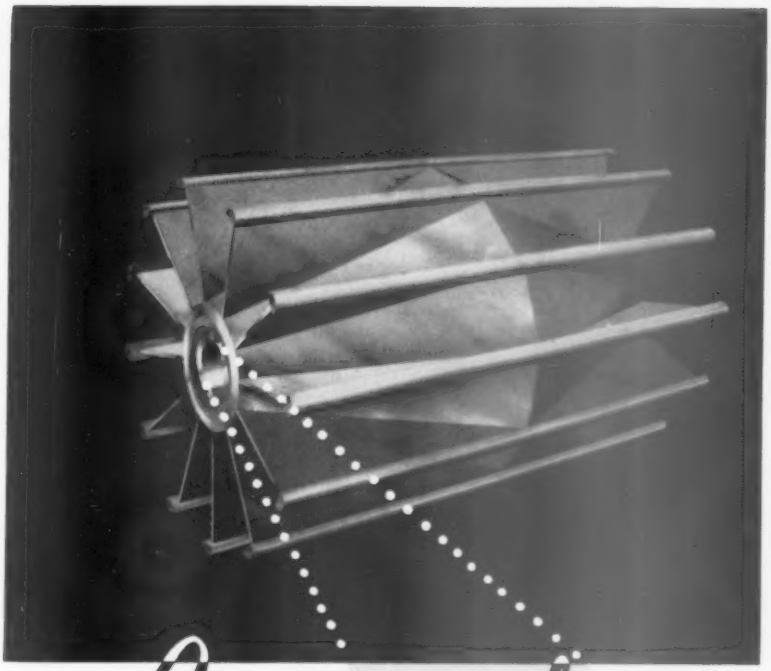
Perlite plant under new ownership

THE PERLITE PLANT at Florence, Colo., formerly operated by Great Lakes Carbon Corp. Perlite Division, has been purchased by Persolite Products Inc., a Denver-based company. Persolite has leased Great Lakes mining claims in Custer County and will use ore mined at the former Great Lakes claims near Rosita to manufacture its product.

The main sales office of Persolite will remain in Denver. Herman Freudenberg, who heads the organization, has named Bob Holbrook superintendent of the Florence plant. Burt Thompson is expanding foreman. Plans call for manufacture of perlite premix in addition to the initial production of lightweight aggregate.

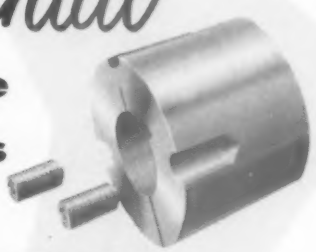
Great Lakes moved out of Florence last spring, and is constructing a new perlite plant at Antonito, Colo.

(Continued on page 57)



Continental

Wing Type Pulleys with



"TAPER-LOCK"® HUBS

Welded Steel Wing Type Self-Cleaning Pulleys — now standard with "Taper-Lock" Hubs.

Self-cleaning pulleys prevent belt mis-alignment due to build-up of material on pulley face. "Taper-Lock" Hubs provide the most satisfactory type of clamp hubs at an economical price, giving the equivalent of a shrunk-on fit while permitting easy assembly and disassembly.

For further information on Welded Steel Pulleys write for Bulletin ID-134.

CGC

INDUSTRIAL DIVISION

Continental Gin Company

BIRMINGHAM, ALABAMA

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Enter 1208 on Reader Card

A. P. GREEN
Plastic and Castable Refractories

Give Longer Service... Lower Maintenance Costs In Kiln Hoods, Coolers and Dust Collectors

A. P. Green Monolithic Refractory Enclosure on Allis-Chalmers Air Quenching Cooler

A. P. Green Monolithic Hood in Modern Cement Plant

A. P. Green Monolithic Enclosure of Dust Collector Housing

A. P. Green Plastic and Castable Refractories form a one-piece, monolithic, air-tight refractory lining. There are no joints for dust to penetrate, bulging is eliminated, and structural strength is increased. No special shapes are required.

The use of A. P. Green Monolithic Construction is finding wide acceptance in all types of patented coolers. Both monolithic side walls and arches on patented cooler enclosures are setting new standards. They offer ease of installation, provision for positive and free floating anchorage, and joint-free surfaces to resist dust penetration and failure due to bulging and buckling.

In kiln hoods, coolers, and dust collectors of some of today's most modern cement and lime plants, the real and definite advantages of monolithic construction provide longer service, reduced maintenance costs, and higher thermal efficiency. Your A. P. Green representative will show you how you, too, can enjoy these money-saving advantages.

A. P. Green offers a complete line of refractory products for the cement and lime industry. Whatever your requirement, for specific recommendations without obligation, contact your local A. P. Green distributor . . . he's listed in the yellow pages of your telephone directory.

A. P. GREEN FIRE BRICK COMPANY
MEXICO, MISSOURI, U.S.A.

PLANTS: Mexico, Mo. • Woodbridge, N. J. • Sulphur Springs, Texas • Jackson, Oak Hill, South Webster, Ohio • Philadelphia, Pa. • Troy, Idaho • Pueblo, Colo. • Macon, Ga.

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A. P. GREEN FIRE BRICK CO., LTD., TORONTO 15, ONTARIO

A. P. Green REFRACTORY PRODUCTS
SERVE THE WORLD'S INDUSTRIES

DISTRIBUTORS IN THE PRINCIPAL CITIES OF THE WORLD

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(Continued from page 55)

New cement firm seeks wharf property

NEW ENGLAND PORTLAND CEMENT CO., INC., a new Delaware corporation headed by Alfred S. Black of Boston, is seeking to lease a 293,600-sq. ft. wharf property from the city of Providence, R. I., for location of a cement storage, processing and distribution plant.

The company has large deposits of limestone in the Rockland-Rockport area of Maine. It plans to manufacture cement clinker and transport it by pipeline to a pier near Camden, Me., for loading on barges. From there, it would be taken to Providence for final processing and distribution. Plans have been drawn for the Camden plant and are in process of being drawn for the Providence plant.

Full output stage reached at Picton

LAKE ONTARIO PORTLAND CEMENT CO., Picton, Ontario, has gone into full production at its new $16-million plant, designed to produce 1.6 million bbl. of cement per year. The plant and quarries cover 700 acres. Dock and handling facilities permit loading of ships with 2,000 to 3,000 bbl. of cement per hour; unloading of coal for the kiln firing can be accomplished at the same rate.

The cement company has sales offices, storage silos and packing facilities in Toronto, Ontario, and Rochester, N.Y.

Opens crushing plant

NATIONAL LIME AND STONE CO., Findlay, Ohio, opened its new stone crushing plant at Buckland, Ohio, the first of May. One thousand tons of limestone can be taken from the quarry daily. Aggregate for highway construction makes up a large part of its market, which also includes agricultural limestone. The quarry and plant occupy an 86-acre site.

Pavement yardage

AWARDS OF CONCRETE PAVEMENT for the month of June and for the first six months of 1958 have been listed by Portland Cement Association as follows:

	Sq. yd. awarded during June	1st 6 mos.
Roads	5,632,525	30,261,610
Streets and alleys	2,937,694	14,888,332
Airports	2,475,136	9,272,808
Totals	11,045,355	54,422,750

(Continued on page 60)

HUBER-WARCO grinders

a hearty appetite for aggregate

The Huber-Warco No. 9 GRINDER has been designed to give big volume aggregate production, with a substantial savings to the user. The No. 9 GRINDER will handle such material as cinders, pumice, haydite, slag and quarry and mine products, with a low power consumption. Capacity of this grinder is 30 yards per hour. The suspended yoke mounted mullers are adjustable to any height, and for finer grinding, the grinding surfaces run together. All gears are long-wearing cut steel. The NO. 9 GRINDER will give years of trouble-free service, with a minimum of maintenance. Huber-Warco GRINDERS range in capacity from 4 to 75 yards per hour to meet any requirement. Write for complete details.

A product of HUBER-WARCO COMPANY, Marion, Ohio, U. S. A.

HUBER-WARCO COMPANY, Marion, Ohio, U.S.A.

☐ Please send me specifications on the Huber-Warco No. 9 Grinder

Name .....

Title .....

Company .....

Address .....

City ..... Zone ..... State .....

HUBER W WARCO

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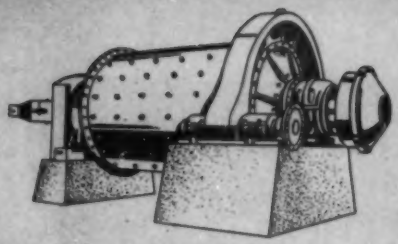
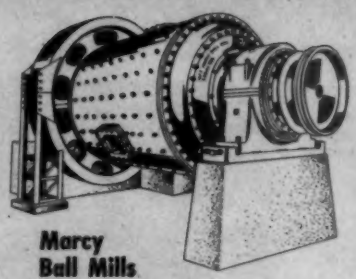
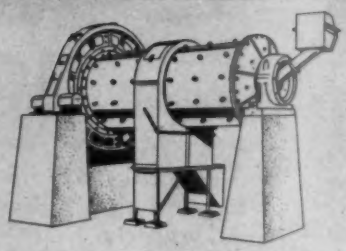


Marcy Rod Mills



Marcy Ball Mills



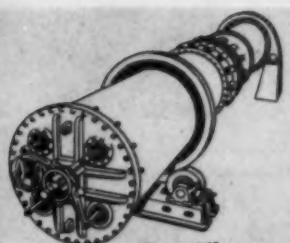
Marcy CPD Rod Mills

We've joined

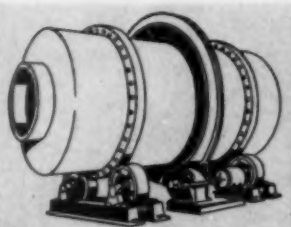
MINE AND SMELTER AND

and <u>you</u> will have

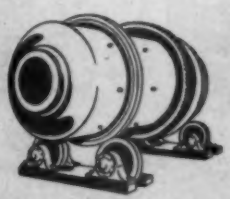
- **the advantage of the combined experience of both companies on *all* jobs.**
- **closer coordination in the application of related equipment**
- **coordinated engineering on complete product line**
- **centralized control of production**
- **convenience of one contact for all products**
- **one source of responsibility on all products**
- **extensive international sales and manufacturing facilities**



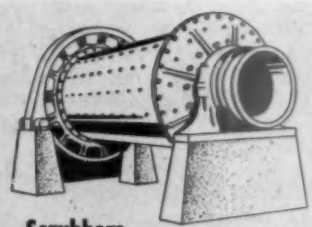
Burt Filters



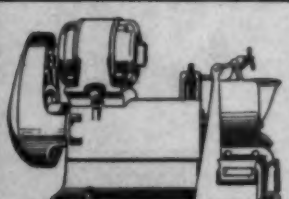
Fusion Furnaces



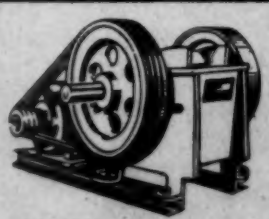
Leaching Drums



Scrubbers



Massco-McCool Pulverizer

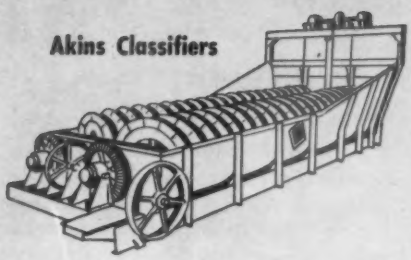


Massco Lab Jaw Crusher

Licensed Manufacturers and Sales Agents in Canada, Australia, Sweden, England and South Africa.

Sales Agents in Chile, Philippine Islands, Japan, New York City (for Continental Europe), and in the principal cities of the United States.

Akins Classifiers



Akins HMS Separators

Akins Densifiers

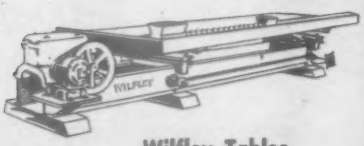
Esperanza Drag Classifiers

forces...

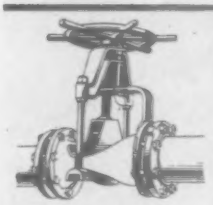
COLORADO IRON WORKS

Since 1952 Colorado Iron Works has been a subsidiary of The Mine and Smelter Supply Co. Now, the two companies have been integrated. The Manufacturing Division (formerly Marcy Mill Division) of Mine and Smelter will include the sales, engineering and production departments of both companies.

Skinner Roasters and Dryers

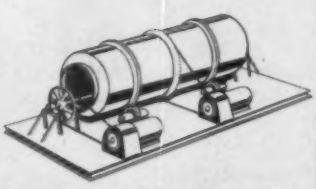


Wilfley Tables



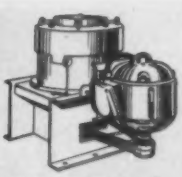
Massco-Grigsby Rubber Pinch Valves

Marcy Pulp Density Scale

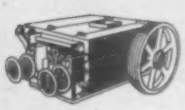


Pug Mills

Vezin Sampler



Massco Gy-Roll Reduction Crusher



Lab Crushing Rolls

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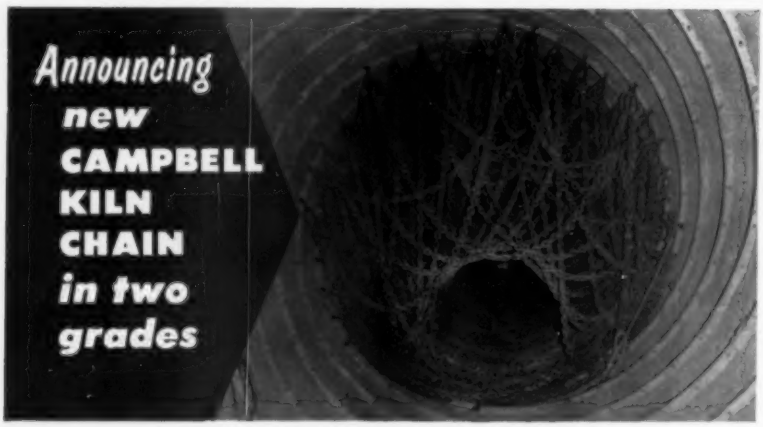

Carbon Steel . . . and New Thermal-Abrasive Resistant No. 7

Now, Campbell Kiln Chain is available in two types of material and in Proof Coil, BBB or Passing Link styles. Campbell Kiln Chain can be supplied to fit any chain system currently in use, and Campbell components for attaching chain within the kiln can be supplied to the same physical specifications as the chain desired. For details contact your Campbell representative, or write the Engineering Division in York, Pa.

CAMPBELL CHAIN

Campbell also manufactures a complete line of chain for all phases of the mining industry.

CAMPBELL CHAIN *Company*

York, Pa.—West Burlington, Iowa • East Cambridge, Mass., Chicago, Ill. Portland, Ore., Seattle, Wash., Los Angeles, Sacramento, San Francisco, Calif.

Makers of Jiffy Lug-Reinforced Tire Chains and Blue Temper pre-cut, packaged chain

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INDUSTRY NEWS

(Continued from page 57)

Financial statements reflect an uptrend

SECOND-QUARTER FINANCIAL STATEMENTS by cement producers generally reflected an uptrend over the first quarter in sales and profits, and compared favorably with the previous year. An industry spokesman looked for sales this year to approximate those of 1957. A sampling of reports from several cement companies yields the following data on second-quarter and first-half net profits for the years 1958 and 1957:

	Second Quarter 1958	1957
Marquette	$2,952,436	$2,142,744
General Portland	2,407,600	2,223,600
Lehigh	2,799,671	3,692,062
Missouri Portland	1,479,924	728,616
Penn-Dixie	2,872,285	1,213,887
Ideal	4,796,442	3,987,238

	First Half 1958	1957
Marquette	$3,468,182	$2,622,355
General Portland	4,046,600	4,106,300
Lehigh	3,609,105	5,243,740
Missouri Portland	1,664,617	898,625
Penn-Dixie	2,910,219	2,043,619
Ideal	6,555,884	6,353,053

Safety Council meets in October

NATIONAL SAFETY COUNCIL will hold its annual convention, the 46th National Safety Congress, October 20-24 in Chicago, Ill. The Cement, Quarry and Mineral Aggregates Section of NSC will hold two sessions.

General chairman of the section is Seymour B. Fleming, safety director of New York Trap Rock Corp. He will introduce the following speakers: Joseph A. Fernandez, personnel and safety supervisor, National Gypsum Co., St. Louis, Mo.; Paul J. Worseck, manager, safety and welfare, Lehigh Portland Cement Co., Allentown, Pa.; A. B. Hoftiezer, safety director, Laverack & Haines, Buffalo, N.Y.; W. Irwin Gill, president, Gill Blast Hole Drilling Co., North Branford, Conn.; R. S. B. Holmes, assistant director of safety, U. S. Steel Corp., Pittsburgh, Pa. and Paul M. Hedley, vice president, production, North American Cement Co., New York, N.Y.

Extend open-pit mine

CANADIAN JOHNS-MANVILLE CO., LTD., Asbestos, Que., is extending open-pit operations at its Jeffrey mine by removing 5,280,000 tons of overburden. The pit extension will lengthen expected pit life until early 1964. Stripping of the overburden, a layer of silty sand and gravel 150 to 200 ft. deep, will take two years to complete.

(Continued on page 62)

NEW TL-16 TRACTOLOADER®

Engine: diesel, 97 hp
Weight: 15,800 lb
Buckets: 1½ to 3½ cu yd

ALL THE EXCLUSIVE FEATURES THAT MAKE THE TL-20 SO POPULAR ARE INCORPORATED IN THE NEW TL-16.

STRONGER AXLE CONNECTION Axles are connected directly to frame with 2-inch diameter steel pins. No rolling and shifting under load!

DUMP CYLINDERS AWAY FROM DIRT Mounted high up and well back on loader . . . away from bucket, away from trouble.

EXTRA STABILITY WITH LONGER WHEELBASE No loss of power and traction getting loads . . . no tipping and spilling traveling with loads.

LONGER REACH Fast, even dumping because there is extra reach — no time wasted leveling load. Long booms available for special loading work.

EXTRA HYDRAULIC PROTECTION Air is double-filtered. Oil is cleaned by a full-flow filter PLUS magnetic and conical screen filters.

OTHER WORKING ADVANTAGES INCLUDE:

Hydraulic Torque Converter Drive • Tip-Back Bucket Power Steering • 4-Wheel Drive • 4-Wheel Power Brakes • "Hi-Traction" Differentials • 4-Way Adjustable Seat • Rear-Axle Disconnect • Bucket Position Indicator

Another Big TRACTOLOADER® with Tractomotive's *Exclusive* Operating Simplicity . . .

SINGLE LEVER SPEED AND DIRECTION CONTROL.

Operator "power-shifts" into *any* forward or reverse gear "on the go" with one lever. There's no speed-range lever or any other shift lever to slow him up! Time saved is yardage gained.

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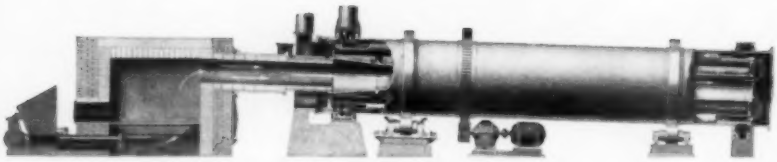

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DRYERS AND HEATERS

- Dry without contamination from combustion gases, regardless of fuel.
- Minimize auxiliary dust collection when handling fine precipitates and filter cake.
- Heat pulverized materials for process work.
- Collect vapors at high concentration.
- Available fabricated with heat and corrosion-resistant materials.

Complete specifications upon request.
Bulletin AH-438-7

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TRIAL SAMPLES

Of World-Famous WHITMORE'S Lubricants NOW IN AEROSOL SPRAY-ON CANS!

HANDI-LUBE LIQUID GEAR COMPOSITION

For open gears, sliding surfaces—exclusive formulas eliminate metal to metal contact, keep wear on the lubricant not the metal—no breakdown even after prolonged use under water—available for every climatic condition—packaged in handy 16-oz. aerosol spray-on containers or in bulk containers—send for a free trial sample.

WIRE ROPE SPRAY LUBRICANT

Exclusive formulas for lubricating and protecting wire rope, chain, springs. Penetrates to the core of wire rope minimizing internal friction and increasing usable life up to 300%—special protective qualities absolutely eliminate corrosion—non-gumming qualities reduce "carry-back"—packaged in handy 16 oz. aerosol spray-on containers or in bulk containers—send for a free trial sample.

65 YEARS OF LEADERSHIP LUBRICATING THE FOLLOWING:

- Open Gears, Dipper Sticks, Cams
- Enclosed Gear Cases
- Wire Rope and Cable
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INDUSTRY NEWS

(Continued from page 60)

HMS process exhibited

AN OPEN HOUSE WAS HELD at Jackson Pike Sand & Gravel Co., Columbus, Ohio, to show architects and builders the plant's new 100-tph. Wemco Mobil Mill, installed last spring to provide the area with premium quality aggregate.

F. W. Sloter, Inc., ready-mix firm which uses a large portion of the plant's output, was co-host at the demonstration of the heavy media separation process. About 150,000 tons of gravel was used by the Sloter firm in 1957, 43 percent of the Jackson Pike 350,000-tpy. output.

Safety contest announced by NSGA

NATIONAL SAND AND GRAVEL ASSOCIATION, Washington, D.C., announces its fourth annual safety contest, covering the period from July 1, 1957 to June 30, 1958. Entries of member companies should be made on a plant basis; those entering several plants should enroll each one separately. There are three classifications in the safety contest: Class A competition for plants producing more than 500,000 tons of sand and gravel during the contest period; Class B for plants producing from 200,000 to 500,000 tons and Class C for plants producing less than 200,000 tons.

Portland cement production

PRODUCTION OF FINISHED portland cement in May, 1958, as reported by the Bureau of Mines, totaled 29,274,000 bbl., a seven-percent increase over May, 1957. Mill shipments for the month were 30,525,000 bbl., a five-percent increase, and stocks on hand May 31, 1958 were 33,674,000, two percent more than on the same date a year ago. Clinker production during May, 1958 was 27,574,000 bbl., an increase of four percent over the year-earlier figure. The statistics were provided by 162 plants in 37 states and Puerto Rico.

PRODUCTION IN APRIL totaled 24,011,000 bbl., an increase of .2 percent over April, 1957. Mill shipments totaled 25,318,000 bbl., an increase of nine percent compared with April, 1957. Stocks on hand April 30, 1958 were 35,179,000 bbl., one percent more than on the year-earlier date. Clinker production for the month totaled 24,171,000 bbl., a decrease of seven percent from the April, 1957, figure.

(Continued on page 65)

FIRST

NOW — Allis-Chalmers Vibrating Screens

FLOAT ON AIR

NEW cars, modern trucks and trains utilize air springs for the smoothest, best controlled ride obtainable. Now Allis-Chalmers has applied the *same type air springs to vibrating screens* to provide greatly improved screen performance.

For complete information, see your nearby A-C representative, or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wis. Ask for Bulletin 07B8931.

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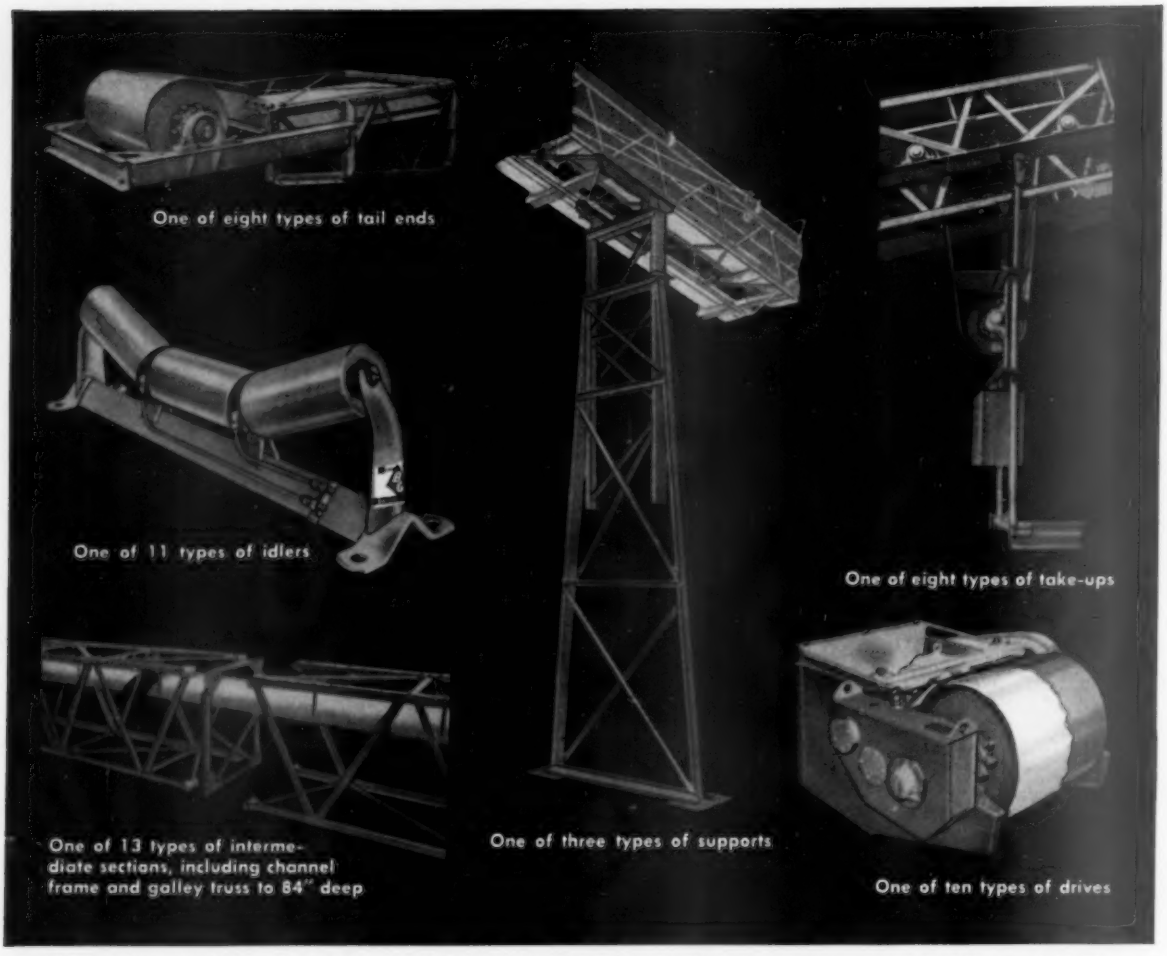
One of eight types of tail ends
One of 11 types of idlers
One of 13 types of intermediate sections, including channel frame and galley truss to 84" deep
One of three types of supports
One of eight types of take-ups
One of ten types of drives

Pictured here are just a few of the many Barber-Greene standardized conveyor components. Each is available in a wide variety of types and sizes, with unmatched flexibility for countless ways of assembly. Write for new bulletin.

Boost conveyor efficiency and cut costs with Barber-Greene standardized components

Every year, more and more belt conveyor installations — long and short, simple and complex — are made up of Barber-Greene standardized, "packaged" components. This standardization means fast, off-the-shelf delivery . . . almost limitless combinations of assembly that cut time and costs on any bulk material handling job . . . components completely interchangeable . . . spare parts readily available . . . simple selection and pricing right from the catalog. Light or heavy, Barber-Greene has the complete conveyor installation you need.

You save these six ways:

- You save special engineering time and expense.
- You save delivery time.
- You save erection time and expense.
- You save on alignment.
- You save on replacement costs.
- You save down time.

58-34-PE

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CONVEYORS . . . LOADERS . . . DITCHERS . . . ASPHALT PAVING EQUIPMENT

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INDUSTRY NEWS

(Continued from page 62)

NLA Operating Meeting program takes shape

THE TENTATIVE PROGRAM for the Operating Meeting of National Lime Association, to be held in Cleveland October 9-11, has been announced. This is one of the most practical programs ever scheduled by NLA and developed by its Permanent Operating Committee.

The program calls for:

1. Panel discussion on ammonium nitrate blasting. Fred Witmer, Ohio Lime Co. (moderator), W. J. Nice, G. & W. H. Corson, Inc., L. E. Firestone, Texas Lime Co., John R. Gardner, Utah Lime and Stone Co., C. Koger, Southern Cement Co. and D. Solz, Basic, Inc.
2. Panel discussion on wet scrubbers (dust control). C. C. Adams, Marblehead Lime Co. (moderator), Sam Brickner, Warner Co., R. W. Bowen, Marblecliff Quarries and W. H. Tock, Basic, Inc.
3. Panel discussion on quadrant preheaters in rotary kilns. Clarence Stielstra, Dow Chemical Co. (moderator), G. R. Lacy, U. S. Gypsum Co., Clarence LaLiberte, Cutler-Magner Co., J. O. Sherod, Warner Co. and Marshall Parsons, Linwood Lime and Stone Co.
4. Plant visitation tour of Euclid Truck Co., Div. of General Motors (luncheon guests of Euclid).
5. New developments on high capacity vertical kiln, by H.R. Spendelow, Jr., Electrometallurgical Co., Ashtabula, Ohio.
6. Lime around the world, by Victor J. Azbe.
7. New industrial gun by W. G. Davis, Remington Arms Co.
8. Large capacity vertical kiln development, by William Robison, Chemstone Corp.
9. Practical approach to noise control in industry, by C. M. Pollard, National Gypsum Co.
10. Good safety practices illustrated with colored slides, Ken Gutschick, National Lime Association. Presentation of ROCK PRODUCTS safety trophies.

In addition, a visit to the Republic Steel Co. plant in Cleveland is a possible program addition.

■

WHITE STONE CO., Hardinsburg, Ky., with capitalization of $100,000, will operate stone quarries in the area. Incorporators were R. E. Hughes, Jr., and Raymond Ragland of Leitchfield and H. W. Tobin of Hardinsburg.

(Continued on page 68)

THERE IS THE RIGHT BIT FOR YOU OUT OF THE MANY POSSIBLE COMBINATIONS OF SIZES AND TYPES

Write today . . . giving all information you can provide. Out of the many combinations possible with four matrices, several stone size ranges, three grades of diamonds, and various face contours we will recommend the bit we believe to be the best suited for your drilling conditions.

Always specify Sprague & Henwood "Oriented" Diamond Bits. They are described and illustrated in Bulletin 320-1.

SPRAGUE & HENWOOD, Inc.
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MEMBER OF: DIAMOND CORE DRILL MANUFACTURERS ASSOC.
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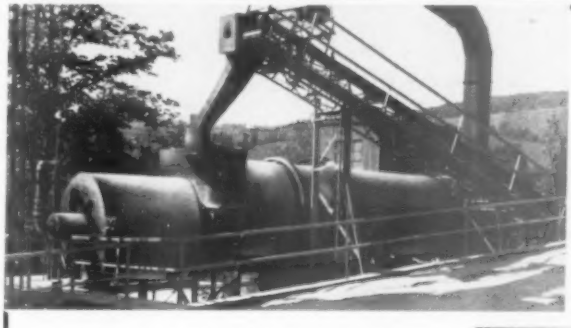

7'-0 x 30'-0 oil heated rotary dryer removes excess moisture.

Unique cup shaped lifters are staggered in the unit to assure even distribution of the sand particles, resulting in greatly increased capacity and efficiency of the dryer.

A McDermott Dryer Installation at the North American Refractories Plant, Little Gap, Pa.
Sound Engineering Economy and Consistently Superior Performance are built into all McDermott

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Dryers . Coolers . Kilns
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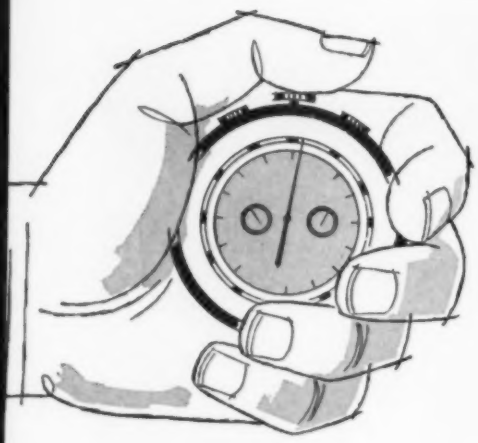


SECONDS SAVED

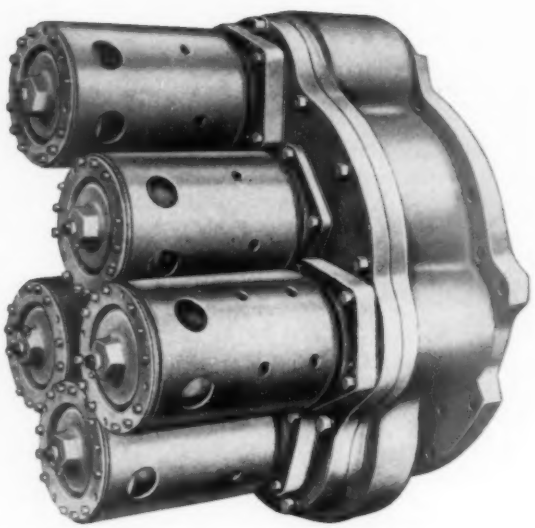
add up fast to give you ...bigger production ...bigger profits

Power-shift transmission on L-W Tournatractor® saves shifting time

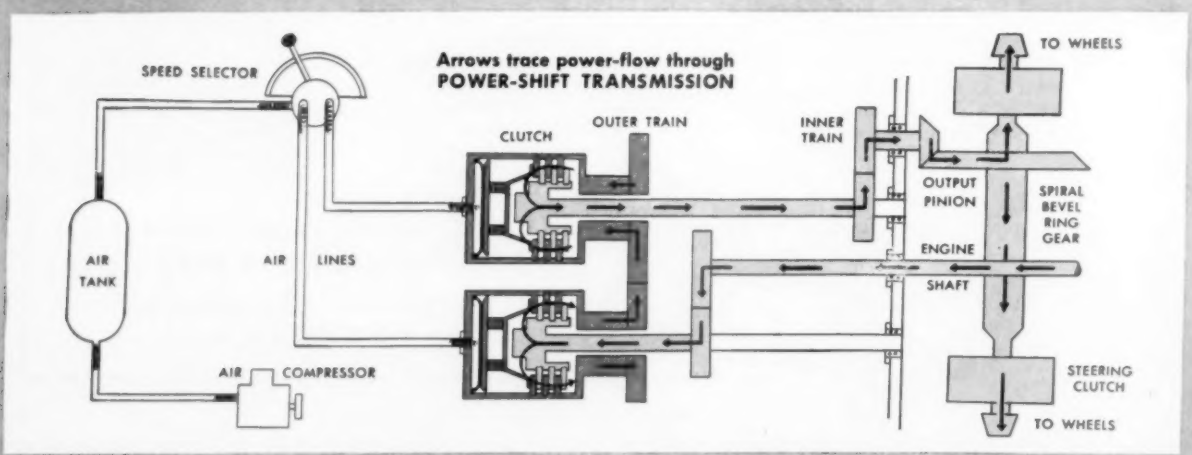
You can save as much as 80 minutes per 10-hr. day in your pit-tractor operations with instant shifting provided by Tournatractor's power-shift transmission.

This transmission is operated by air clutches for fast, efficient gear changes. Mounted individually on the ends of the gear shafts, the clutches engage and release in proper combinations through the operation of a simple selector lever. It requires little operator effort.

LeTourneau-Westinghouse power-shift transmission gives you non-stop, instantaneous speed-selection and high reverse speeds. There is no need to depress a clutch foot-pedal . . . no double-clutching . . . no meshing of one gear against another. With quick movement of the small speed selector, operator transfers power instantly from one gear ratio to another . . . with no gear clashing, no chance of locking out-of-gear. It gives faster pickup for drifting a load when dozing, and for pushing or pulling . . . gets more work done in less time!



Air-actuated transmission clutches save seconds — increase production. Each of the five 7" multiple-disc clutches in L-W Tournatractor transmission has 290 square inches of positive gripping surface. These heavy-duty clutches engage and release in proper combinations at the touch of a control lever. To make clutch adjustments, all you do is loosen a few Allen-head screws and turn adjusting ring "in" or "out." Transmission gears are fully enclosed and operate in a bath of oil. Lubrication points are conveniently located for quick, easy accessibility.



Torque converter saves seconds thru faster, more efficient operation

With Tournatractor's highly efficient single stage torque converter you get the equivalent of an infinite number of gear ratios within any gear range. It insures effective application of maximum horsepower at all times, over the complete speed range from 0.0 to 17.2 mph.

The LeTourneau-Westinghouse torque converter is a low-pressure unit, simple, and trouble-free. It has a single impeller, single turbine, and single reactor. Because it operates at low pressure, it is easy to keep the system sealed for lower maintenance.

Torque converter smooths out the shock of changing gears. It automatically balances load and torque, making gear selection less critical. Maximum efficiency is secured at all times by all of your operators. It automatically adjusts the speed ratio for more power, more speed, as needed. It provides you with better performance at all times in all your pit-tractor operations . . . dozing blasted rock on shovel clean-up, maintaining stockpiles, pushing gondolas, pulling other equipment, or maintaining haul-roads.

Ask for more information

To save seconds that add up fast for greater work-capacity and bigger profits, it will pay you to look further into Tournatractor. Write LeTourneau-Westinghouse Co., Box 240, Peoria, Illinois for free 32-page Tournatractor Bulletin. *Ask for a demonstration on your job.* See why this high-speed, rubber-tired tractor has faster acceleration, better maneuverability, lower maintenance, to give you the speed and mobility you need in your pit operation.

CT-1888-M-2

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

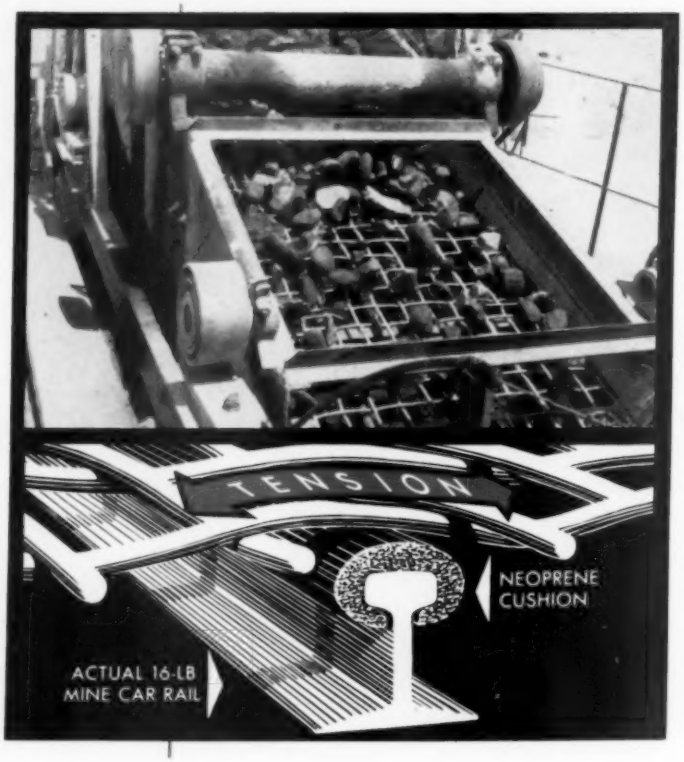
A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

VIBRATION with a VENGEANCE

solves your toughest screening problems!

here's another of
several good reasons



For construction features that really pay off, Overstrom gets right down to bedrock! Screen cloth is supported on actual mine car rails, capped with thick neoprene cushions that lock in place — can't twist off when cloth is installed and tensioned. Rugged rails don't sag, twist, or buckle, even under heaviest day-in, day-out punishment. Proper crown assures positive cloth contact over all support rails. Cloth can't "flap" under vibration. This heavy-duty design means longer cloth life, more uniform screening action, and greater freedom from blinding. It means you have the best in vibrating screens.

OVERSTROM *VIBRATING* SCREENS

There's an Overstrom Vibrating Screen for every type application in the production of aggregates and industrial minerals. Write for data and recommendations.

OVERSTROM & SONS, INC • 2213 WEST MISSION RD • ALHAMBRA, CALIFORNIA

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INDUSTRY NEWS

(Continued from page 65)

Lime producer triples output

ROUND ROCK WHITE LIME CO., Round Rock, Texas, is engaging in a $750,000 plant expansion which will triple its production. The new facilities, scheduled for operation by the first of January, include two rotary kilns, preheaters and coolers. According to D. L. Pickett, president, the expansion is a long-range plan to keep abreast of the demand being sparked by extensive use of lime for soil stabilization, increased uses for water purification and in the chemical industries.

Diatomaceous earth plant erected at Lovelock

THE EAGLE-PICHER CO., Joplin, Mo., expected completion during August of its new diatomaceous earth plant at Lovelock, Nev. Kaiser Engineers designed and installed the plant which includes a 9 x 120-ft. rotary kiln, blowers, cyclones, traps and air heater.

When operating at capacity, the plant will produce 36,000 tons of natural and calcined filter aids per year.

Permanente acquires Olympic Portland

PERMANENTE CEMENT CO., Oakland, Calif., has purchased all of the stock of Olympic Portland Cement Co., Ltd., Seattle, Wash., it was announced by Wallace A. Marsh, Permanente's vice president and general manager.

Olympic was a 64-percent owned subsidiary of United Molasses Co., Ltd., London, and had a 1,750,000-bbl. plant at Bellingham, Wash., and cement storage facilities at Seattle. The purchase has increased Permanente's cement producing capacity by 16 percent: combined capacity of its two California plants is 11 million bbl. per year.

Aggregate plant opens

BAYSHORE ROCK, INC., Coyote, Calif., has opened a new aggregate plant on the Battaglia Ranch. George F. Baird, owner, said initial production will feature washed sand for concrete batching plants. Other equipment will be installed to produce various grades of aggregates from Coyote Creek rock beds. Bayshore Rock also operates a portable crushing plant nearby which will be integrated with the new plant.

END

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Want to cut your pit-haul costs?

How 15-speed "blade" can help your haulers make extra pit-to-plant trips every day

You'll reduce the per-ton cost of hauling, boost pit output every day, by traveling your haulers at higher speed. Faster haul speeds are practical *only* when your pit floor, benches, and haul roads are kept clean, smooth, and well drained. The better your surface, the faster you haul . . . the more trips per day, the lower your pit-haul costs.

To keep your haul routes in tip-top shape you need graders that can do maximum work. You need machines that can make heavier cuts, push bigger loads, work and travel faster . . . machines that can always work your tough materials at, or near, full power. This requires a wider range, and more selective gear-ratios than most graders afford.

More speeds for full-power work

Only Adams* 80 to 150 hp graders give you the extra work-speeds you need. They provide 8 standard speeds forward and 4 reverse, plus 3 creeper gears (opt.) . . . that's 15 speeds in constant-mesh transmission.

For building and maintaining haul roads, ditching, and clean-up at pit, plant, and stockpile, Adams gives you 4 efficient forward working speeds. Other graders with 6 forward speeds have only 3 working gears . . . often cannot develop full push-power at the faster speeds that are "just right" for the job.

Adams' 2 intermediate gears, 10 and 14 mph, are handy for light, fast blading, snow plowing, maneuvering and climbing tough grades. And travel speeds to 26 mph save time between grading assignments . . . time that can be used for extra blade-work.

Up to 30% more push-cycles on one-way grading

Most graders have only 2 reverse gears . . . about 3 and 7 mph. Adams has 4 reverse speeds — 2 for working, 2 for high-speed back-up. Adams' top reverse speeds (8 and 13 mph) pay big dividends. Often your operator works a 200′ to 400′ stretch, or even more, that is too short or too confined to make turning-around worthwhile. Instead, he backs-up. The Adams makes the reverse trip fast . . . converts usually wasted travel-time to extra blade-work.

Creeper gears for added "muscle", precise control of grade

Three optional creeper speeds, 31′ to 160′ per min. (full power, 0.41 to 1.82 mph), afford a means to concentrate full engine-power for ripping-up and regrading old roadways, pioneering for exploration and new roads, clearing overburden of stumps and roots and working thru rocky ground. They eliminate the costly common practice of "slipping the clutch" at high rpm to get maximum power at slow speed . . . reduce shock and clutch wear. Creepers also help you cut more accurate grades, and work in tight places.

190 hp POWER-*Flow** 660

For maximum push-power *at all speeds*, Adams POWER-*Flow* Model 660 with torque converter gives you the effective work-power of an *infinite* number of gear ratios, from 0.0 mph to 27.4 mph forward.

Any one of the 7 Adams graders — 190, 160, 135, 123, 115, 85, and 60 hp — will handle more work per $ investment. There is a size to fit your grading problems in any type of pit-plant situation. In any size, Adams will keep your haul routes smoother than can similar competitive machines. Call us for details.

Adams graders can handle more of your type of jobs, save time and money with efficient interchangeable attachments. These include: *Scarifier* for ripping-up old roadways and rock-filled soil, *bulldozer* for spreading and casting dirt and road materials, *snow equipment* for clearing roads, *push-plate* for push-loading scrapers and starting balky haulers.

*Trademark G-1626-MQ-1

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

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to more economical plant operation

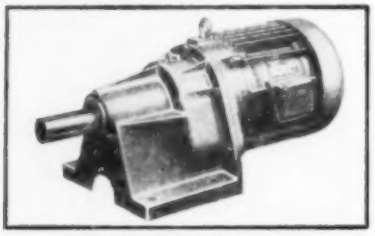
BAUER
DRUM MOTORS & GEAR MOTORS

BAUER SELF-DRIVEN HEAD PULLEY

Motor, gears, all moving parts integrally designed in a compact efficient, one-piece totally enclosed conveyor drive unit.

Eliminates V-Belts, external drives and all safety hazards. Cuts down on maintenance time. Easy, quick installation.

From ¼ to 15 H.P. in all standard widths and diameters. Service and parts readily available in U.S.



BAUER GEAR MOTORS

1/50 to 30 HP—0.3 to 400 RPM

Quality Motors Economy Priced

Over 30 years of experience and know-how are built into every BAUER gear motor and drum motor.

Totally enclosed and fan-cooled BAUER gear motors are designed to function well in any position, vertical, horizontal or wall mounted.

For further information check with your distributor or write for illustrated literature to: RP-1

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Calendar of Coming Conventions

1958

September 17-19, 1958—
Rocky Mountain Minerals Conference (AIME), Salt Lake City, Utah

September 22-25, 1958—
American Mining Congress, 1958 Metal Mining and Industrial Minerals Convention and Exposition, San Francisco, Calif.

Sept. 30-Oct. 2, 1958—
National Sand and Gravel Association, Semi-Annual Meeting, Board of Directors, The Tropicana Hotel, Las Vegas, Nev.

October 9-11, 1958—
National Lime Association, Fall Operating Meeting, Hotel Cleveland, Cleveland, Ohio

October 13-18, 1958—
National Industrial Sand Association, Fall Meeting, The Greenbrier, White Sulphur Springs, W. Va.

October 16-18, 1958—
Empire State Sand, Gravel and Ready Mix Association, Fall Conference, Concord Hotel, Kiamesha Lake, N.Y.

October 20-24, 1958—
National Safety Congress, 46th Annual Convention of National Safety Council, Cement, Quarry & Mineral Aggregates Section, Conrad Hilton Hotel, Chicago, Ill.

October 21-22, 1958—
National Slag Association, 41st Annual Meeting, The Mayflower Hotel, Washington, D.C.

October 23-25, 1958—
Mid-America Minerals Conference (AIME), St. Louis, Missouri

1959

January 20-21, 1959—
National Agricultural Limestone Institute, 14th Annual Convention, Hotel Statler, Washington, D.C.

January 22, 1959—
National Crushed Limestone Institute, 4th Annual Convention, Hotel Statler, Washington, D.C.

January 27-30, 1959—
National Crushed Stone Association, 42nd Annual Convention, Bal Harbour Area Hotel Group, Miami Beach, Fla.

February 2-6, 1959—
American Society for Testing Materials, Committee Week, Penn-Sheraton Hotel, Pittsburgh, Pa.

February 15-19, 1959—
National Sand and Gravel Association, 43rd Annual Convention, Hotel Roosevelt, New Orleans, La.

June 21-26, 1959—
American Society for Testing Materials, Annual Meeting, Chalfonte-Haddon Hall, Atlantic City, N.J.

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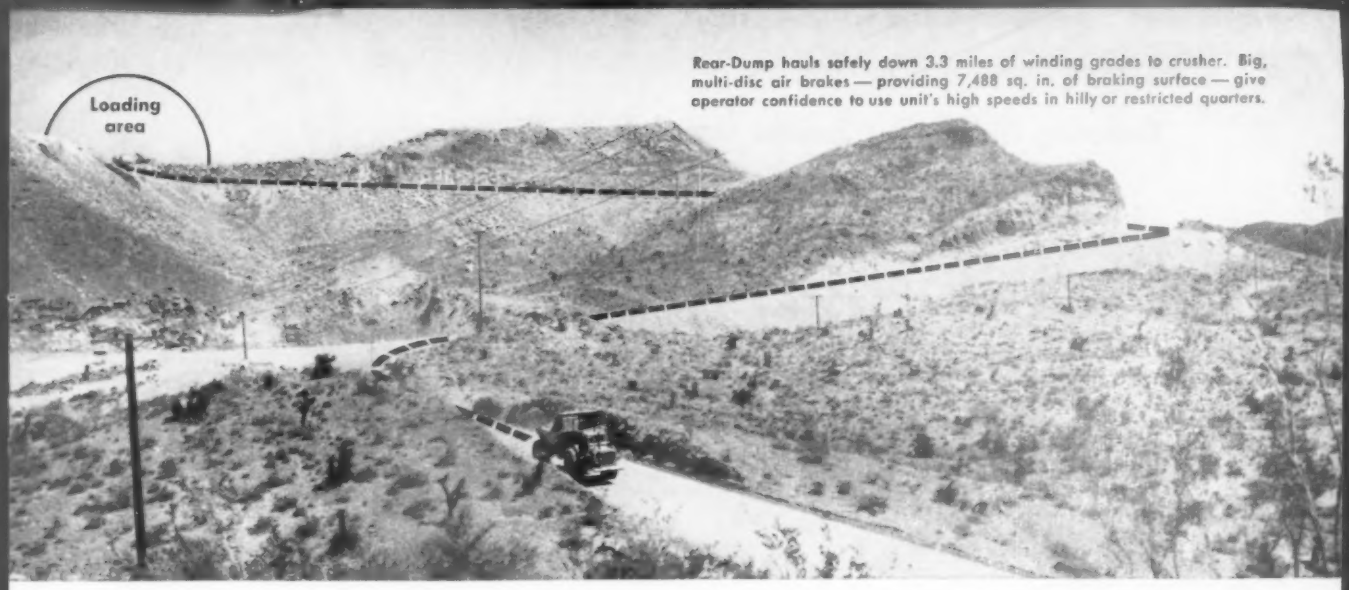

Rear-Dump hauls safely down 3.3 miles of winding grades to crusher. Big, multi-disc air brakes — providing 7,488 sq. in. of braking surface — give operator confidence to use unit's high speeds in hilly or restricted quarters.

On 6.6-mile cycle . . .

two 35-ton haulers move 2,352 tons limestone daily

A large California cement plant produces 5 million barrels of cement a year. To meet today's stepped-up demands, the company is mining limestone at several pits at Oro Grande — 24 hrs. a day, 5 days a week. Important tools in their hauling fleet are two LeTourneau-Westinghouse 35-ton B Tournapull® Rear-Dumps. Here's how these high-production units perform:

Haul up and down average 3 to 4% grades

35-ton B Rear-Dumps are loaded to heaped capacity by a 2½-yd. shovel. Units then haul material 3½ miles to crushing plant. On the haul, Tournapulls travel up 4% grade for 1/5 mile, and then over an average 3 to 4% down-grade for 3⅓ miles. Despite waiting time at shovel and plant hopper, company records show the two Rear-Dumps average 98 tons (2.8 loads) per hour. At this rate, units haul 784 tons per 8-hr. shift . . . or 2,352 tons daily.

"Maneuverable, easy to maintain"

Quarry Superintendent commented, "I like the 'B's' . . . they're maneuverable and easy to maintain. And on steep downhill hauls we have to have their sure, safe brakes." Added one of the operators, "The B Rear-Dump is easy to control. We do our own lube and it takes me only 5 minutes per machine."

Use rubber-tired tractor for clean-up

The company uses another LeTourneau-Westinghouse tool to speed pit operations. It is a high-speed 210 hp Tournatractor®. This rubber-tired tractor shuttles around the multiple pit operations fast — cleans up around shovels and blast area, and maintains haul roads. On blast clean-up, Tournatractor completes the job in ⅓ the time it used to take with a crawler tractor.

Cut operating costs

Any pit operation shows more production . . . more profit . . . when it has modern high-speed equipment in its fleet. Why not arrange for a demonstration of LeTourneau-Westinghouse Rear-Dump, and/or Tournatractor? Call or write for complete details. No obligation.

BRCT-1540-QMJ-1

Big B Rear-Dump empties 35-ton load of limestone into hopper. Electric hoist motor — operated by electric switch on dashboard—lifts bowl at any desired angle for slow, precision feeding.

Tournatractor cleans up around 2½-yd. electric-power shovel at California limestone pit. Rubber-tired tractor drives job-to-job fast — crosses air-drill hoses, electric cables, railroad tracks, pavement, without damage. Operator says: "Tournatractor is fast . . . beats a crawler to keep pits and haul roads clean."

LeTOURNEAU-WESTINGHOUSE COMPANY, PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

Where quality is a habit

Operating 19 Link-Belt Speeder shovel-cranes, Gifford-Hill Companies from Louisiana to West Texas demonstrate how

King-size

HERE's an organization that has standardized on Link-Belt Speeder shovel-cranes—uses models ranging from ½ to 3-yard capacities. Their experience with the King-size K-models (the 1¾-yd. K-370 and the 3-yd. K-608) has proved the K's are as fast and maneuverable as smaller rigs . . . frequently outproduce machines of larger ratings.

This bonus in output stems from the many Link-Belt Speeder advanced design features including Speed-o-Matic power hydraulic controls . . . bonus usable horsepower . . . hydraulic power steer.

If you'd like details on any Link-Belt Speeder crawler or rubber-tired models and the facts why they will help you move ahead of competition—contact your distributor or write LINK-BELT SPEEDER CORPORATION, CEDAR RAPIDS, IOWA.

OPERATOR'S REPORT: Running one of Gifford-Hill's 19 Link-Belt Speeder machines (a K-595 3-yard dragline) is Eugene Jistel. He says, "It's a very fast dragline for getting the work out . . . also is very easy to handle because of Speed-o-Matic. It has plenty of power and is easy to steer." 14,937

K-models deliver bonus output

AVERAGE PRODUCTION IS HIGH for this K-608 at Gifford-Hill's Bridgeport, Texas operation. Rig is equipped with torque converter as standard equipment. High-speed cycles pay off in a hurry, also increase efficiency of haulers.

1¾-YD. K-375 STRIPS OVERBURDEN—LOADS TRUCKS. With Speed-o-Matic controls, bonus usable horsepower (138 hp at the drums), power steer and extra strength of all components—this K-375 maintains steady pace year after year.

LINK-BELT SPEEDER

It's time to compare . . . with a Link-Belt Speeder

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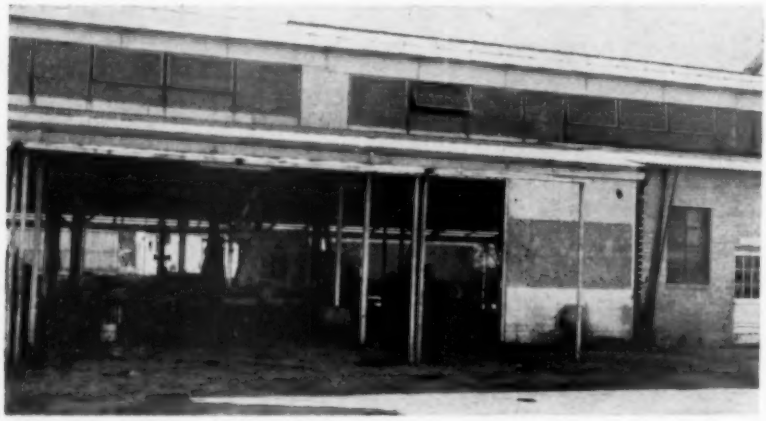
HINTS AND HELPS

Profit-making ideas developed by operating men



Play it cool in summer

A NUMBER OF ROCK PRODUCTS PRODUCERS operate in locations that get mighty cold in winter but almost unbearably hot in summer. A building that is tight enough for winter can become like a furnace during the heat of day in summer.

Here's what one southern producer did to his maintenance building. The corrugated siding was fastened to huge HINGED panels, using translucent siding to admit light. In the winter, the panels are secured at the bottom, but in the spring, summer and early fall, the hinged sides are raised and supported. In this way the whole building is ventilated, the working area is extended and a high level of output is maintained whatever the weather.

What happens to old gondolas?

USUALLY, THEY JUST FADE AWAY like the old soldiers they are, but this western gravel producer with an eye for profit rescued two ancient gondolas from oblivion.

Taking them off their trucks he mounted them on concrete piers and used them to store several sizes of gravel he was making for a special order. Each car was provided with a new plate in the middle to make two bins, one for each hopper gate. One of the rejuvenated carcasses was fitted with extended sides to increase its storage capacity.

A large volume of storage capacity was provided with a very small investment in installation expense. Since the cars were built with good quality steel they should last a long time. If not, they can be scrapped without a second thought and replaced without very much difficulty.

Pipe joint pointers

WHITE LEAD, carbonate of lead ground in boiled linseed oil, is commonly used for preventing leakage through threaded pipe joints. It is all right where pressures are not high or suddenly applied.

Red lead, an oxide of lead ground in boiled linseed oil, hardens more quickly than white lead and is preferable where pressure is turned on soon after joints are made up.

Litharge is a lead oxide made by heating lead in a current of air, and is excellent where quick hardening is desired. It hardens more quickly than red lead and is useful where a truly durable and tight joint is wanted.

Many pipe men prefer graphite because of its lower coefficient of friction. This enables the workman to do a better mechanical job, for the threads can be made to seat better. Thus in one instance red lead was used on brass piping. It was decided to make a test by subjecting the piping to pressure and it was found that over 80 percent of the joints leaked. The line was taken down, the threads were washed with gasoline, and then a graphite mixture was used. All leaking was eliminated.

W. F. Schaphorst, M. E.
Newark, N. J.

Water spray for trucks

ROCK PRODUCTS PRODUCERS in big cities seem to have public relations headaches when they must make deliveries in or near residential areas. Spilled materials and dusty loads seem to generate a rash of complaints in almost any metropolitan area.

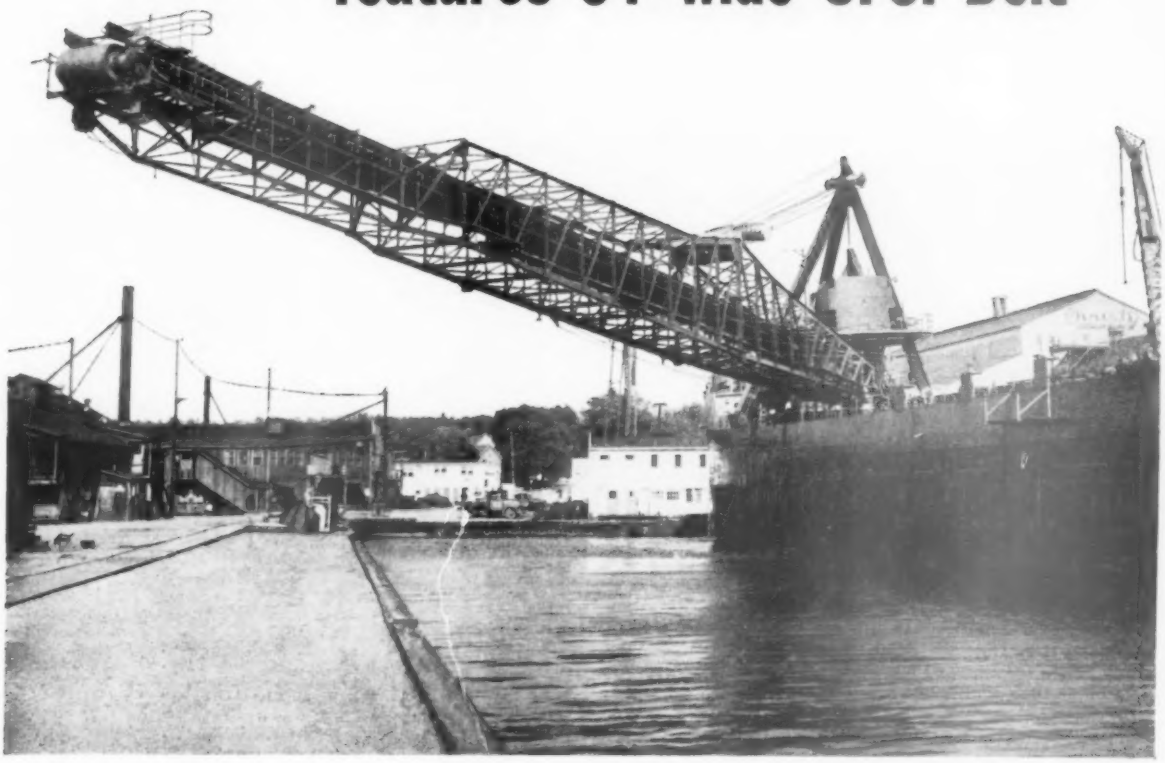
One enterprising producer takes the edge off these complaints by spraying every load of aggregates before it leaves the plant. Simple perforations along a pipe provide enough moisture to wet the surface of the load of material in the truck. At the same time, each truck load is inspected to make sure that it is not loaded heavily enough to spill on curves.

These simple precautions have paid off handsomely in an excellent community feeling toward this producer, enabling him to maintain production and deliveries in a large city without friction.

(Continued on page 81)

CONVEYOR BELTS

BIG BOOM on the Great Lakes features 54" wide U. S. Belt



To keep pace with the stepped up demand for coal and limestone, the Columbia Transportation Division of Oglebay Norton Company examined their veteran of the Great Lakes, the bulk carrier W. W. Holloway.

Could enough life be put in the old girl yet to meet the beefed-up demand? *It could.*

By converting her to a self-unloader, by installing a 245-foot conveyor boom (one of the largest on the Great Lakes) and finally, by equipping the boom with a 54" U. S. Rubber Conveyor Belt, today the 52-year-old ship is operating profitably. Each hour, 3500 tons of 90-lb. limestone are dumped onto the conveyor belt and carried ashore at a speed of 625 fpm. Because "U.S." belts are built to carry heavy loads and withstand abrasion, this U. S. Giant® is operating perfectly, helping to turn this ship from a has-been into a heroine.

For conversion, replacement, or new installations, U. S. Rubber has the right belt and the best engineering skills to do the job.

When you think of rubber, think of your "U. S." Distributor. He's your best on-the-spot source of technical aid, quick delivery and quality industrial rubber products.

Mechanical Goods Division

United States Rubber

WORLD'S LARGEST MANUFACTURER OF INDUSTRIAL RUBBER PRODUCTS

Rockefeller Center, New York 20, N.Y. In Canada: Dominion Rubber Company, Ltd.

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ESCO POINTS and ADAPTERS MOVE 35 MILLION CUBIC YARDS ON SP SALT LAKE CAUSEWAY

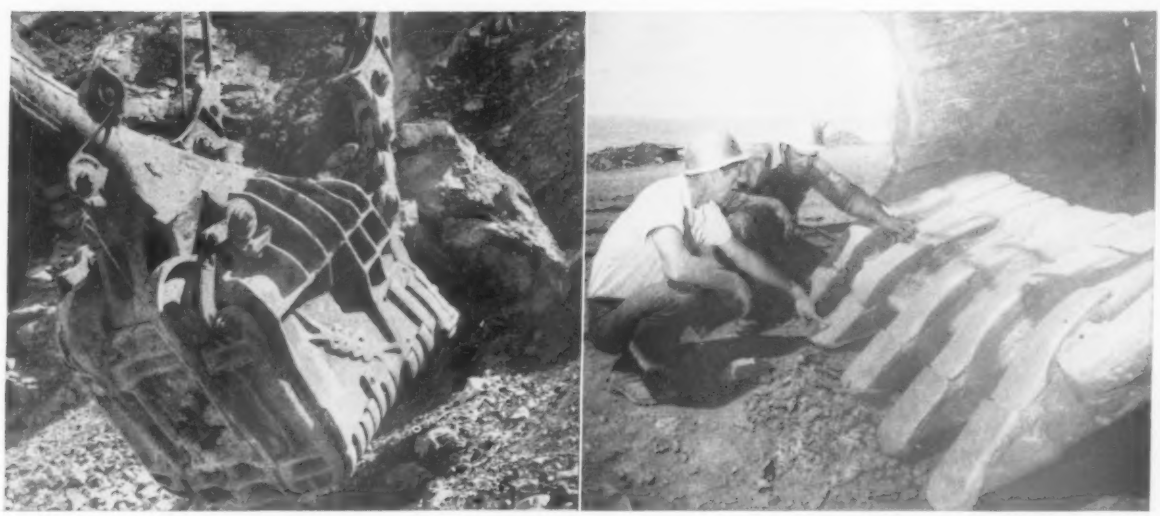
ESCO points and wearcap adapters on M-K's dippers are quarrying the 35 million cubic yards of fill material for the mammoth causeway.

EVERY *ESCO* POINT IS BRINELL TESTED TO ASSURE THE MAXIMUM DEGREE OF ABRASION-RESISTANCE HARDNESS AND LONG LIFE

SEVERE DIGGING CONDITIONS EXPERIENCED

Shovel operators and mechanics, veterans in all types of rock excavation, say they have never experienced such severe digging conditions as the high silica content quartz being quarried by Morrison-Knudsen Company for the 13-mile long Great Salt Lake railroad crossing of the Southern Pacific Railroad.

Increased point wear caused by this highly abrasive material makes the quick-change feature of *ESCO* points an important factor in keeping downtime to an absolute minimum. Easy-to-change *ESCO* points save at least half the time required in replacing bolt-on teeth.



ESCO Cast 12M Points and Adapters Cut Costs 4 Ways:

1. Quick-Change design reduces downtime. Four *ESCO* points can be removed and replaced in only five minutes.
2. *ESCO* points are quickly available for every digging tool from one convenient source.
3. Points feature self-sharpening design. There are eight point shapes to choose from.
4. Cast design permits extra metal at wear points. Points are heat treated and differentially hardened for long life.

See your nearest *ESCO* dealer. Ask for *ESCO* Tested Points Catalog No. 187.

ESCO®

ELECTRIC STEEL FOUNDRY COMPANY

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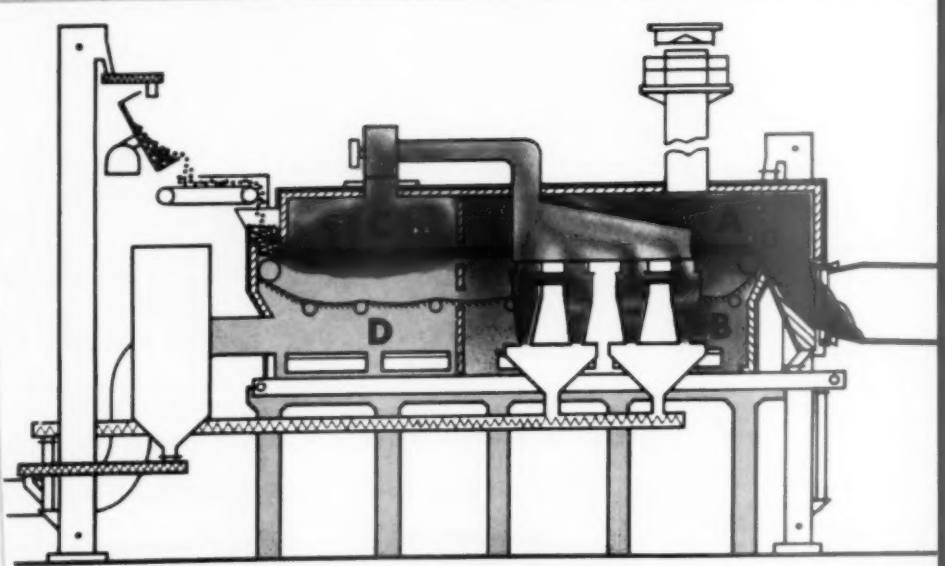
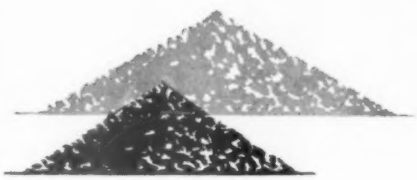
Clean and...
EFFICIENT

THE
ACL
SYSTEM



ACL is an Allis-Chalmers trademark.

A new concept in cleanliness! The new *ACL* system offers lower dust loss — cleaner cement production. Stack discharge is merely a wisp. Complete dust-free plants have been constructed within large cities and in suburban neighborhoods. The system meets even the most stringent municipal air pollution codes. Other advantages are: maximum burning efficiency, reclamation of material, power savings and small space requirements.



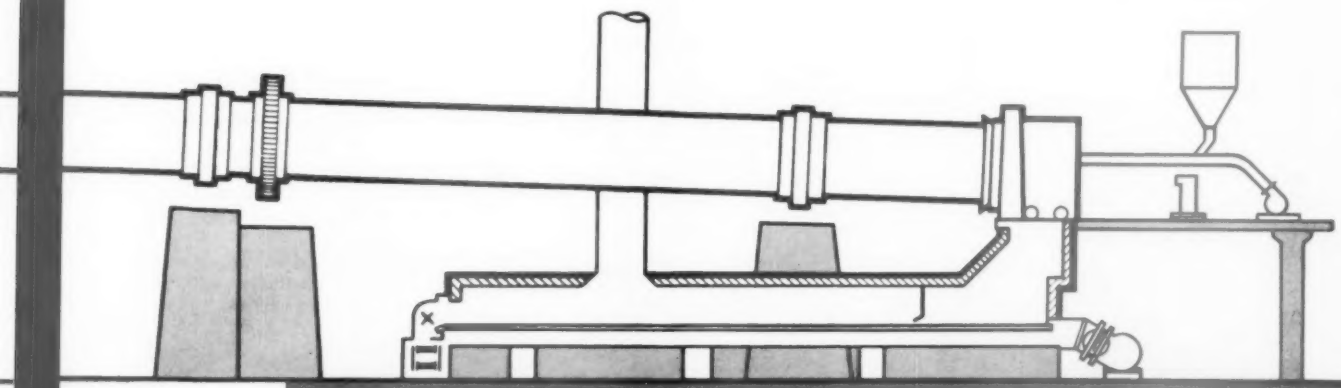
40% less fuel per barrel of clinker

ACL systems now in operation consume fuel at an average of 600,000 Btu per barrel of clinker. Compare this to fuel requirements of conventional long, dry-process kilns which use from 800,000 to 1,000,000 Btu. And the *ACL* double-pass system is designed to use any conventional fuel—powdered coal, fuel oil, natural or coke oven gas.

For details, ask your A-C man for a copy of Bulletin 07B8431. Or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin.

How the *ACL* double-pass system works

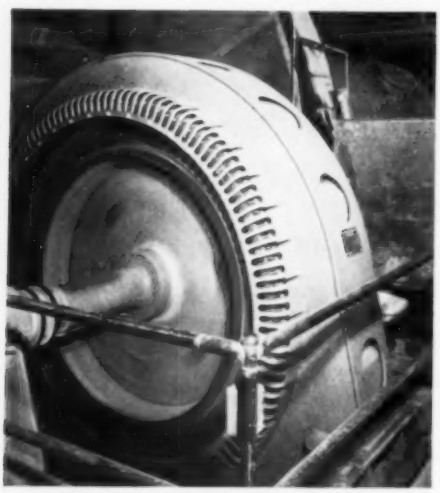
Partial calcining and dust reclamation take place as hottest gases pass through pellet bed on traveling grate. Gas temperatures are reduced from about 1800 to 500 degrees in this first pass (A to B). Next, gases pass through cyclones where larger dust particles are removed, and carried back to pelletizer. Final dust filtering takes place as gases pass through moist pellets on feed end of grate. In the second pass (C to D) gas temperatures are reduced more. Heat of kiln gases is transferred to material.



ALLIS-CHALMERS

A 3783

G-E SYSTEM ENGINEERING assistance helped reduce construction time and costs on Permanente Cement Co. plant expansion.



NEW BALL MILLS at Permanente Plant are powered by heavy-duty General Electric synchronous motors. Speed-torque characteristics of this 1000-hp motor are matched to the mill to give more dependable starting under specific power system conditions at this plant. G-E motor design provides reliable performance, maximum safety and ease of maintenance.

INDIVIDUAL FIELD EXCITATION for existing and new synchronous ball mill drives is supplied by efficient G-E motor-generator sets. Triple-protected Tri-Clad* motors, combined with job-matched d-c generators provide a more economical, faster-responding power source.

AT PERMANENTE CEMENT CO., G-E EQUIPMENT HELPS . . .

Boost Plant Capacity 1,500,000 bbls./year

The addition of a sixth kiln and three new ball mills at Permanente Cement Company's huge Permanente, California, plant boosted output by 1,500,000 barrels per year. This expansion, necessitated by increased demands from the Company's western states and Pacific islands market brings plant capacity to 8,500,000 barrels per year.

Engineering responsibility for the expansion lay with Kaiser Engineers. Working together with General Electric Application Engineers on a coordinated system basis, they utilized the latest engineering techniques to obtain optimum performance at reduced cost and construction time.

To achieve maximum savings on your plant expansion program, call on General Electric early in your planning stage. Your nearby G-E sales engineer will be happy to assist you, anytime. General Electric Company, Schenectady 5, New York. 658-22

Engineered Electrical Systems for the Cement Industry

GENERAL ELECTRIC

G-E MOTOR CONTROL CENTER (r.) centralizes operation of precipitator and auxiliary motors for greater convenience and safety. Limitamp* 2300-v controllers (l.) are for induced draft fan motor and for transformer supplying 480-v power to motor-control center.

* *Registered Trade-mark of General Electric Co.*

HINTS AND HELPS

(Continued from page 74)

Who's nosy?

ALMOST ANY BUILDING with laboratory equipment seems to attract a lot of interest and inquisitive visitors. But in the deep South it is almost necessary to open the buildings as much as possible—an open invitation for the curious.

This rock producer solved the problem by enclosing his plant laboratory with fencing. This lets the technicians work in comfort, keeps the equipment and samples free from tampering or contamination and inoffensively keeps everyone else at a distance.

Hydraulic excavator

IT SEEMS THAT IT takes tough problems to bring out the real ingenuity of rock products producers. Here's a southern limerock producer who was being dollared to death with heavy labor expense to clean up his quarry before blasting. His high calcium rock is heavily fissured and filled with pockets of clay. Since the rock is too soft to stand up under the rough treatment which would remove the clay in a washing plant it was necessary for him to find an easier way to clean up the vertical pockets and seams.

With a flash of inspiration he devised a hydraulic probe which could be lowered into the rock cavities to flush them clean. A jet of water through the end of a 23-ft. pipe does the actual work, while another stream of water feeds the clay sludge to a pump mounted on top of the device.

Using water from his storage pond, a pair of 1,200 gpm. pumps delivers water at 150 psi. pressure to the probe. Clay laden water is delivered to a distant settling pond.

This method requires only three men—a far cry from the tedious labors of 30 to 40 men using pick, shovel and buckets. Where these men could only clean up the worst of the clay, the new method leaves the stone clean as a whistle at a fraction of the cost. Ingenuity made the difference!

Wire rope care

BECAUSE WIRE ROPE is so widely available and relatively inexpensive, many producers and their maintenance people seem to lose sight of the fact that wire rope is a valuable commodity. The manufacturers know this and package it in heavy reels, well lubricated and carefully wrapped.

Here is how one producer took care of his reels of wire rope. He built a sturdy framework of pipe and rod to support them. Each roll was carefully rewrapped after removing a length of wire. The heavy wire rope was pulled out in a long length without permitting kinking. Since the rolls were mounted on pipe axles on the framework, the rope was readily pulled off.

Skyhook needed

EVERY ONCE IN AWHILE it seems that no matter how long the boom on a crane, a job comes up which requires one just a few feet longer. That's what happened on this southern cement producer's job when he put a concrete slab on a set of new silos.

The enterprising contractor's foreman provided a most effective jury rig to solve this dilemma when he lashed a new pole to the end of his rigging crane. It is no problem now to lift the pouring bucket from the ground to the top of the silos.

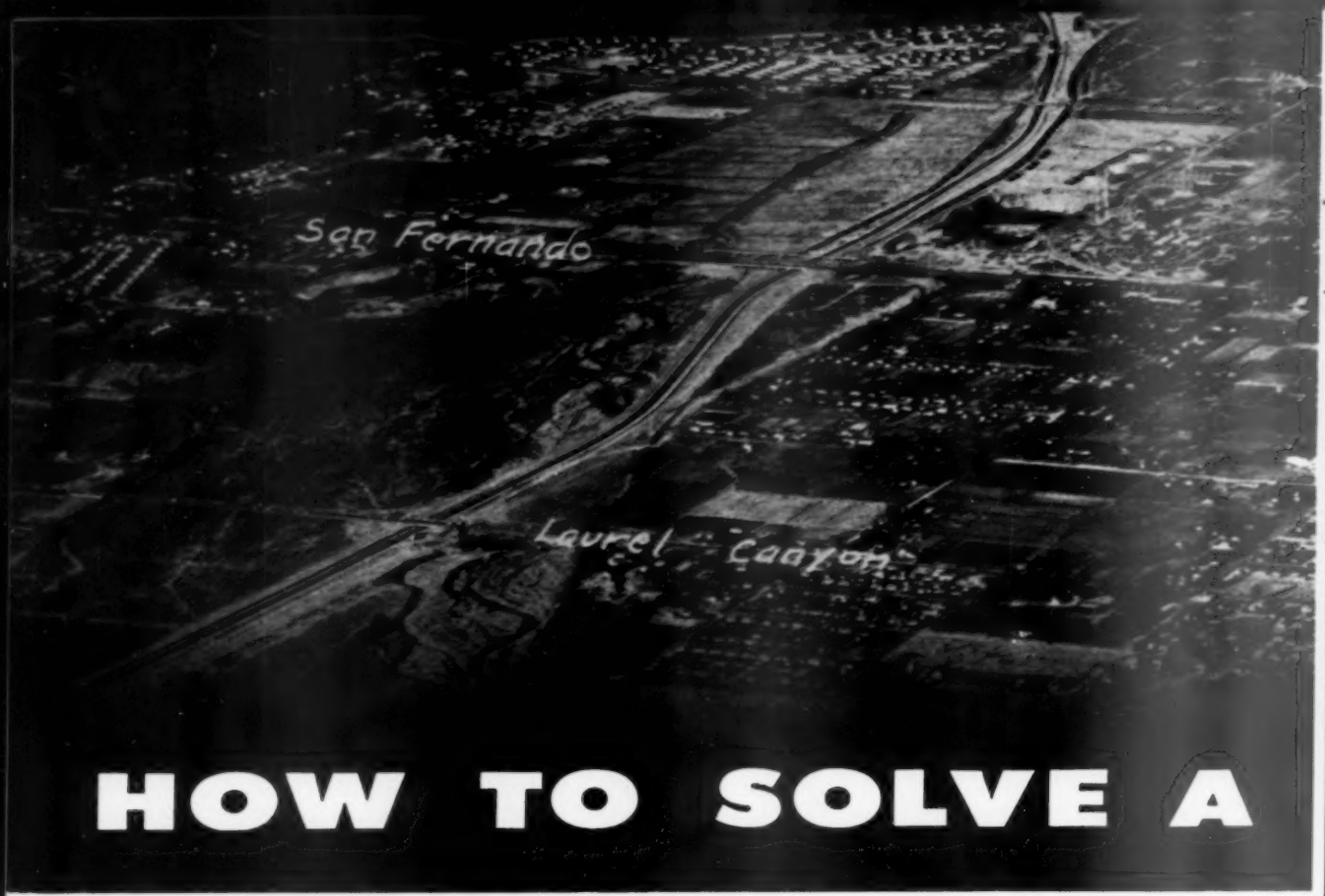
Concrete forms can be made of paper

ROCK PRODUCTS PRODUCERS use plenty of concrete around their plants, but one of the major reasons they don't use more is the difficulty and expense of making the necessary forms.

One Chicago-area producer now uses a heavy paper strip which can be shaped, formed into cylinders or cones, or bent to make concrete forms of almost any dimension. The manager of one plant uses these paper strips to make all the cylindrical piers for supporting the A-frames of a new conveyor system.

When the plant is cleaned up the strips will be removed from the concrete and discarded. If handled carefully, the strips could be reused.

END



HOW TO SOLVE A

By JOSEPH N. BELL

Los Angeles did it by

IN THESE DAYS WHEN ROCK PRODUCTS producers are facing up to some acute zoning problems all over the nation, the city of Los Angeles has come up with a workable solution, decidedly in the public interest, which one planning official summarized like this: "We're putting a ring around our natural resources and then refusing to let them be encroached on."

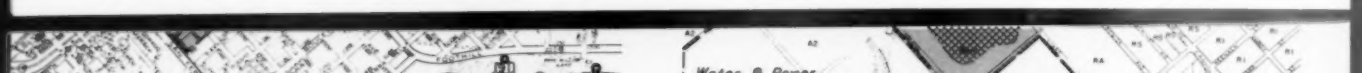
If this idyllic situation hasn't been wholly attained in Los Angeles, at least it's a target toward which both rock producers and planning officials are shooting. And to harassed rock products operators who are fighting for their lives with zoning officials in other parts of the country, such a philosophy would indeed be a tremendous step in the right direction. How did it come about in Los Angeles? And can the principles applied there be applied equally well elsewhere?

The answer to the second question is an emphatic, "Yes." The remainder of this article will endeavor to answer the first question in such a way that rock products operators all over the nation can apply the lessons learned in Los Angeles to their own localities.

The beginning of the present enlightened situation in Los Angeles could really be marked in 1946. In that year, city officials took a long, hard look at the hodgepodge of zoning laws which had grown up with the booming area of southern California. It was apparent that instead of patch-work repairs, the zoning laws needed to be completely overhauled. Accordingly, in 1946, the city began a long, serious re-study of zoning ordinances in light of the spectacular growth of Los Angeles.

"This was no haphazard job," Milton Breivogel, Planning Director of Los Angeles County, told me. "We called in educators, architects, builders, homeowners, businessmen, industrialists — everyone with a stake in this problem and others who could give us sound advice. We did research in depth throughout the city. We wanted to make it possible for industry to survive and still protect the residential community. We tried to make rules that everyone could live with."

Prior to 1946, many Los Angeles areas were not zoned at all; as a result of the new zoning laws, every piece of property in the city was zoned. There were created, however, what were known as



ZONING PROBLEM

putting a protective ring around its natural resources

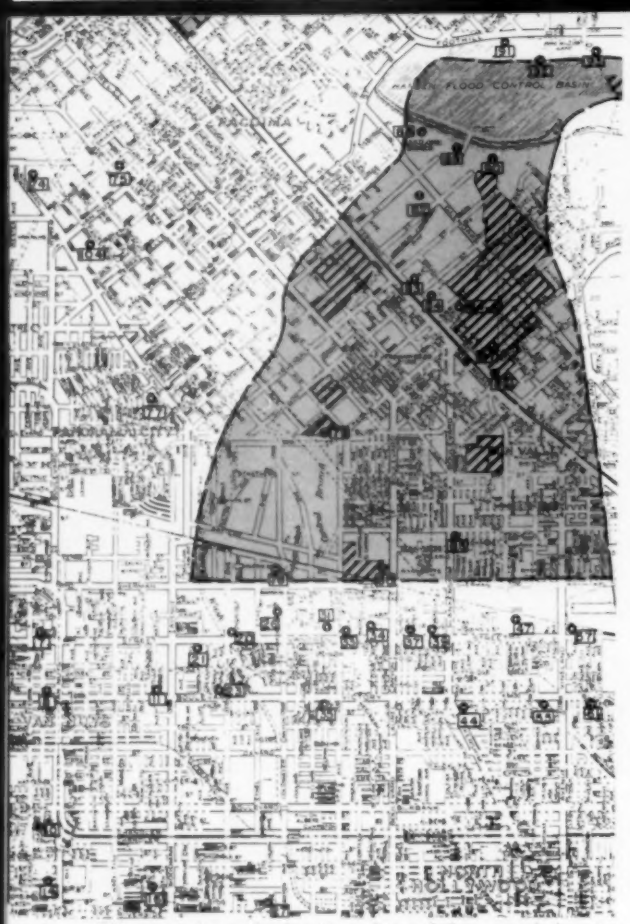
underlying zones, or supplemental use districts. An area zoned primarily as agricultural or commercial, for example, might have a supplemental designation for oil drilling or rock and gravel. Many rock areas were in these "supplemental districts." In order to mine them, producers had to apply for permission from the Planning Commission. As these applications began to multiply in the early '50's, the opposition to granting them grew strong and vociferous.

The rock products people claimed diminution of resources and said that supplemental districts within the city must be opened up for rock mining or the whole of Los Angeles would suffer. The opposition — mostly homeowners — claimed just as persistently that this wasn't the case at all, that the materials could be obtained from localities where they wouldn't be a nuisance to surrounding residential areas. About this time, some ominous things began happening to rock products in the Los Angeles area. As sources began to dry up without replenishing, prices began to rise. And as operators had to move ever further from the construction areas for materials, haul prices began rising, too. That's when the city did a remarkably objective and introspective job of soul searching and came up with an answer fair to everyone.

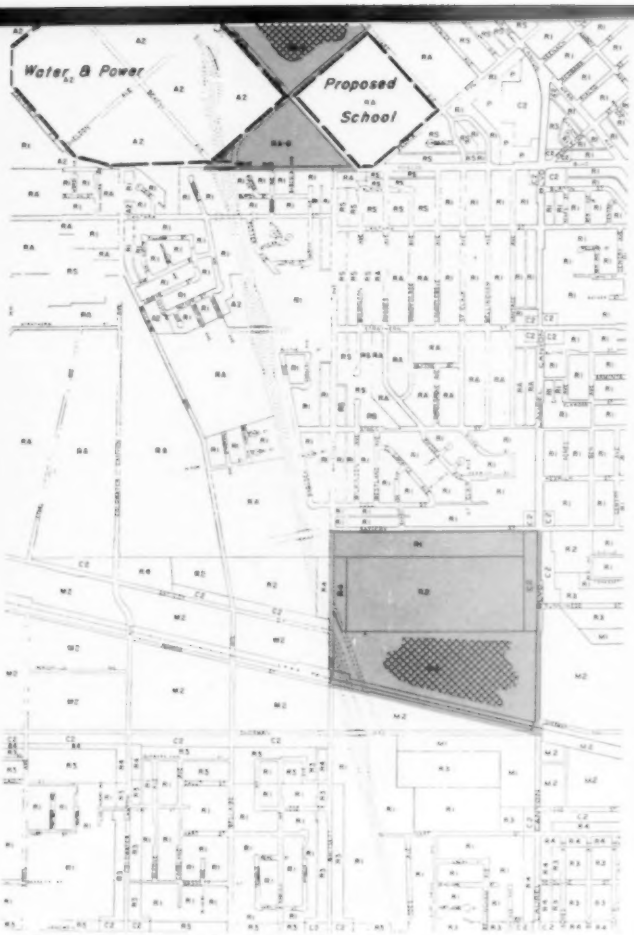
"We decided," said Karl Ourston, Senior City Planner of the Los Angeles Planning Commission, "to have a survey made to find out once and for all exactly where there were commercially feasible sand and gravel deposits in the city of Los Angeles."

"We realized," recalls Mr. Ourston, "that we were cutting our own throat if we got too restrictive. One of the major economic bases of Los Angeles is the construction industry. It's a major source of employment here, and anything which affects it seriously affects the entire community. Because our building codes out here are rigorous, we require tremendous amounts of concrete in our building construction. Therefore, the whole city is sensitive to anything affecting sand and gravel operations."

In this situation, the obvious choice to conduct such a study was a chunky, gravel-voiced, wry-



This map shows the location of test holes, gravel deposits and gravel company property in the Los Angeles area. Colored areas are gravel deposits; boxed numbers are sites of test holes and shaded area pinpoints gravel property



Colored areas here show gravel deposits; shaded areas are gravel company property. Zoning symbols mean: RA—Residential, Agriculture; A—Agriculture; M—Manufacturing; G—Gravel

How to solve a zoning problem

continued . . .

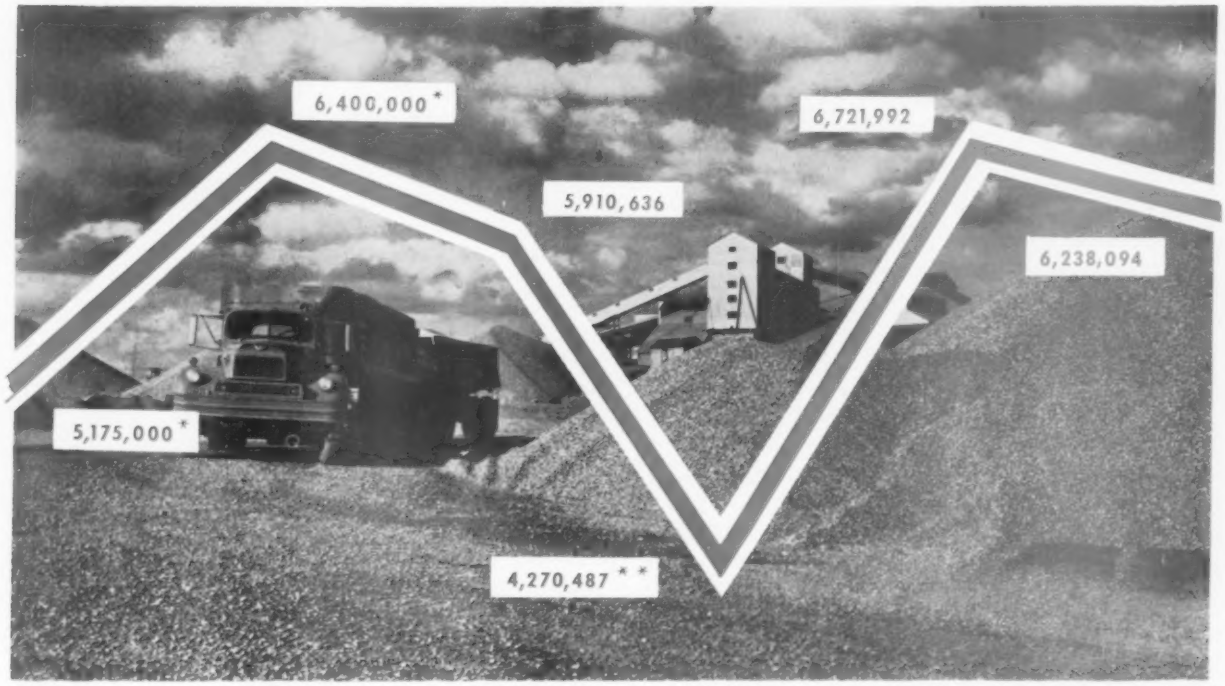
witted consulting engineer named Frank Gillelen, who had already done a tremendous job of liaison between the rock producers and zoning officials of Los Angeles. A Civil Engineering graduate of the University of California, Frank Gillelen has spent most of his working life as a practicing engineer in the Los Angeles area. In 1943, he was appointed to head up the Board of Public Works in that city, and during his 10 years in that job, he became intimately acquainted with both the problems of the city and the problems of the rock products people with whom he often dealt in his official capacity.

When he returned to private practice, Mr. Gillelen was retained by several rock companies for engineering jobs. When these companies had zoning problems they consulted him for advice. And there were some acute zoning difficulties during this period. Los Angeles — growing faster than any other city in the United States—was reaching its residential tentacles into many of the areas either being worked or planned for working by rock producers. There were arguments and recriminations before the planning commissions of both the city and the county.

So, early in 1954, Frank Gillelen began a careful and detailed study of the city of Los Angeles aimed at locating and designating all practical sand and gravel and rock deposits so that city planning officials could solve zoning disputes intelligently, factually and in the public interest. He took scores of borings throughout the area, and in September of 1954 submitted a report which has materially affected the future of the rock industries—and the well being of millions of citizens —in the Los Angeles area.

His report showed that at the current average annual consumption, the present quarrying area of rock products producers in the city of Los Angeles would be exhausted in 15.5 years. "Production may be prolonged to some extent by deeper excavation," said the report, "but the economical

Aggregate production in the San Fernando Valley was crippled by a strike in 1955



*estimated **nine months due to strike

excavation depth is limited by the necessity of maintaining 50 ft. of set back from property lines, side slopes of one to one, and by the depth to ground water. At best the material available from the area where excavation is permitted will not last over about 20 years."

The Gillelen report also pointed up the economic problems that Los Angeles would have to face if mineral resources in the San Fernando Valley—source of about one-third of Los Angeles' sand and gravel—couldn't be exploited further. The study indicated that when present supplies are exhausted, consumers will have to pay $1.25 per ton more to cover the additional cost of transportation from the nearest other source. "At the 1953 rate of consumption," says the report, "the additional cost to consumers will amount to nearly $8 million per year for an indefinite number of years—up by 76 percent. The preservation of the San Fernando Valley's natural resources is important. Residential and commercial improvements are rapidly reducing the available gravel area.

"Contiguous to the existing rock and gravel plants," concluded the Gillelen study, "are 765 acres on which present zoning will not permit gravel operations that have a potential supply of 113 million tons. If made available, they would add about 20 years to the life of the present gravel source. Unless steps are taken to preserve this natural resource, a large part of these areas may be covered with buildings and will no longer be available for rock and gravel production."

It is to the everlasting credit of the public officials in Los Angeles that the Gillelen report was put to immediate and active use in framing the policies of the city Planning Commission as they relate to the rock industries. I discussed these policies at some length with Karl Ourston and Milton Breivogel—in addition to Mr. Gillelen and members of the planning staff of both city and county.

What have been the practical effects of the Gillelen survey in Los Angeles?

First of all there has been a sort of gentleman's agreement on the part of commissioners and staff members of the Planning Commission to be more lenient toward rock and sand and gravel operators now that there's a very clear understanding that these resources are strictly limited and going fast. Secondly, there has been much less opposition to requests that new areas be opened up to rock quarrying. Although some applications have been modified or conditioned by the city, none have been turned down since the survey was made.

The only thing approximating outright failure took place in a suburban area where one local housewife has made a life work out of opposing rock industries attempting to mine some rich re-

Good public relations is the key to better zoning laws

How to solve a zoning problem

continued . . .

sources in the area. Her opposition has been intelligent, well calculated and completely effective —so much so that she once instigated a turnout of 3,000 citizens to oppose the application of a rock products operator. When it looked as if a new request might be acted on favorably following the Gillelen survey, she influenced the local Park Commission to demand the property in question for a city park. The company withdrew its application because the park will have to be approved by a referendum which will probably vote it down—at which time the application can be renewed.

Designation of these natural resource zones has also exerted a profound indirect effect on people and businesses contemplating moving into these areas, which are clearly identified by signs. Although—by the theory of the underlying zones—they can be used for other purposes than quarrying, their new designation as natural resource zones has acted as a powerful deterrent against anyone else moving in. Everyone knows that these areas may be turned into rock plants; a seller of any of this property must fill out an affidavit saying that the buyer has read in his presence that the property is zoned for sand and gravel production. As a result, there has been neither residential nor commercial construction in these areas since the survey was made and published.

Both Mr. Breivogel and Mr. Ourston, sensitive to the problems of the rock products people, have some sincere advice to offer rock products operators—and particularly those in difficulties with local zoning boards.

"I suggest to rock products people who want to operate as good neighbors in the community in which they do business," say Mr. Ourston, "that they put themselves in the shoes of the adjoining residential owners. Ask yourself what you—as a homeowner—would find objectionable in the operation of the rock plant, and be guided accordingly. These objectionable phases of the operation should be discerned by the rock products operator first—then eliminated before they generate antagonism. This is the best way I know to keep out of trouble with planning officials and neighbors alike. Once community antagonism becomes organized, it's usually too late to repair the damage. Anticipate it—and then don't let it happen."

To this, Mr. Breivogel would add: "Rock products operators must understand that the planning and zoning official has a job to do that is much broader than this one land use. Mining operations must fit into the broad plan of the community that the planning official sees. Rock products operators must make their operations compatible with the rest of the community—not in opposition to it. They can't operate a nuisance and expect people to be friendly to them."

What then would the two Los Angeles planning officials and Mr. Gillelen suggest as a sensible plan to enable individual operators, the nation over, to operate harmoniously with zoning officials? They recommend a 10-point program:

1. Get a copy of applicable zoning laws, study them, familiarize yourself with them. In other words, know what you're talking about.

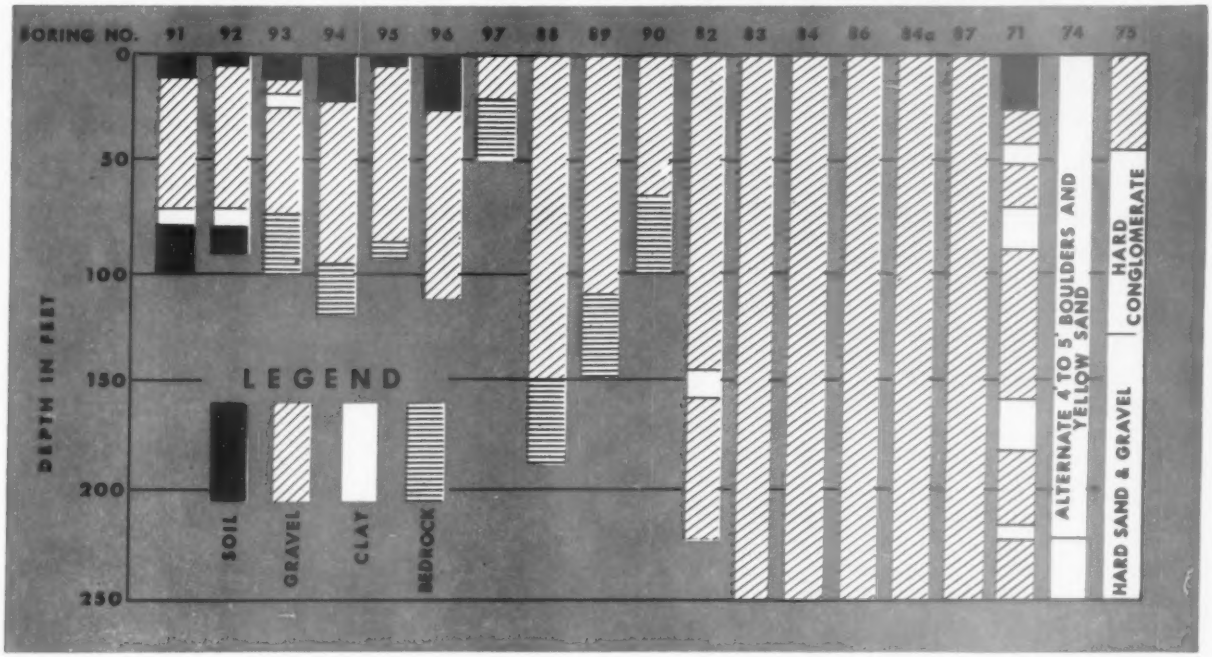
2. Determine who has jurisdiction—state, county, city or township—and know the officials in direct charge.

3. Before meeting with them make sure your house is in order—that your housekeeping is satisfactory, your operations as compatible as they economically can be with the nature of the neighborhood, that you have definite plans to rehabilitate your property in the public interest.

4. Meet with zoning officials informally and explain the economics of a sand and gravel operation. There is a fundamental misconception all over the country concerning the availability of sand and gravel of good quality in minable quantities. Try to explain this and the importance of these products to the city as factually as possible.

5. Attempt to sell the city on a minerals survey similar to the one carried out by Mr. Gillelen in Los Angeles. This will provide a strictly factual foundation on which to build the sand and gravel story. Knowledge of the limited nature of these resources, technically documented, is a persuasive argument to zoning officials and forestalls speculation on the most important issue involved—e.g. just how straight are the cries of alarm of depletion being put forth by rock products producers. If the city can't afford such a survey, there's nothing wrong with the rock products producers in the area cooperating to pay part of the cost as long as an objective engineer—trusted fully by city officials—is hired to do the job.

Test borings like these were taken throughout the Los Angeles area



6. Work with zoning officials to create an "area of natural resources" which can't be encroached on because it constitutes the highest and best use of the property in the interests of the general public.

7. Get active in public affairs in your community. Get to know other businessmen and industrialists and public officials on a personal basis. Gain recognition as a public-spirited citizen interested in progress and enlightened public interest.

8. Take advantage of every opportunity to explain your economic story elsewhere—to friends in other businesses, to the local Chamber of Commerce, any local industrial association or city improvement group, customers and operators of allied industries. Build up a backlog of goodwill and potential assistance on which you can draw when and if the necessity arises.

9. Keep your public relations local—and personal. Most of the trouble comes from residents in the immediate neighborhood of the plant. They should be visited frequently and asked if noise or dust or trucks are bothering them—and then an effort should be made to correct it or to explain to them why nothing can be done. If you can live with your immediate neighbors, you'll have little difficulty living with the community as a whole.

10. And, above all, practice what you preach. When complaints come in to the city and are passed along to you, do something about them right now. Avoid traffic violations with your trucks; if you spray debris on streets, clean it up as soon as it's called to your attention. In other words, don't just build a facade of good fellowship; practice it.

But this doesn't mean lavish entertainment of public officials or expensive programs of paid public relations. All of the men emphasized this point.

"The relations of the rock products people with city officials here are good," says Frank Gillelen, "yet to my knowledge the companies never entertain officials or even have any formal get-togethers with them. The operators of most of the rock companies and the public officials know each other—but not as rock products people and civil servants but rather as individuals and citizens and friends pulling together against common problems."

"We try to settle our problems at the staff level," adds Milton Breivogel, "before they ever go before the Planning Commission. We've found that sincere, adult people can talk over things and get them settled. We don't get mad at each other. We try to keep it above a personal basis, which I realize is easier here than in a smaller community. Yet it can be done. But the most important thing of all is a mutual respect; we understand and appreciate the problems of the rock products people, and they—in turn—know what we're up against."

"Some sand and gravel companies," said Karl Ourston, "have been too independent—have resisted controls in the public interest. They've made it hard on themselves. The cooperation that exists here in Los Angeles doesn't exist in many other

Please turn to page 146

Raw crushing and screening are done in quarry building. Next, stone is conveyed nearly one-half mile to plant storage

To win a market,

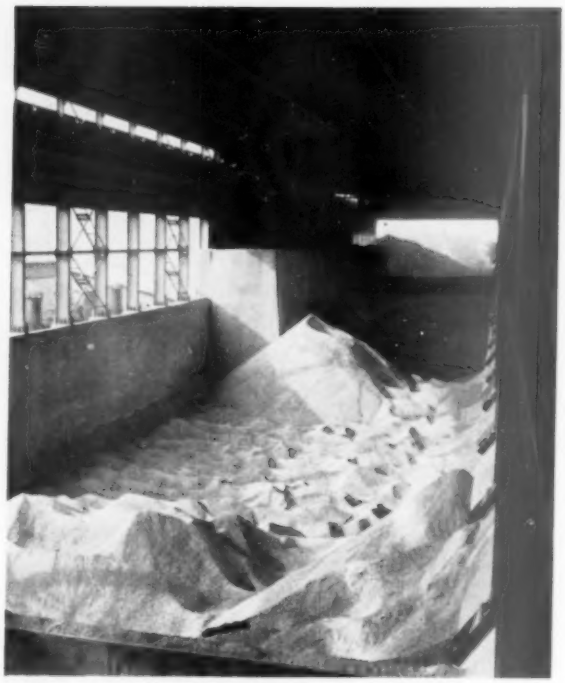
Lehigh expands at

By ELWOOD MESCHTER

IN BUSINESS the winner gets there "firstest with the mostest." Lehigh Portland Cement Co. gets to the cement-hungry Baltimore and Washington markets "firstest" with a plant at Union Bridge, Maryland, closer to these markets than any competitor. But to get here with the "mostest," the plant had to grow. Grow it did: its capacity has been tripled by the most ambitious expansion program in the company's history.

But the plant didn't grow haphazardly. The key word in this expansion is flexibility. From quarry to shipping, Lehigh designed a big-volume plant with many unusual features to make it adaptable to almost any production need. Great care was taken to assure accurate blending of raw materials before burning and to provide for producing high quality cement. And, to forestall any clash with the nearby farming community that supplies the plant's labor force and with nearby suburban developments, dust-control equipment in this dry-process plant is also big and efficient.

Flexible production is achieved with three huge kilns, each with a potential capacity of 1 million bbl. per year. These kilns can produce clinker for all the specification type cements.



Clinker and raw storage shed (over 900 ft. long) holds so much that plant can work independently of the quarry

A huge storage building is the heart of the new plant. Here, where they can be carefully segregated according to their chemical analyses, are kept all the raw materials—coal, gypsum, sandstone, shale, iron bearing material, and several grades of limestone and clinker. Since there's plenty of space, long, continuous production runs are possible without replenishing supplies of any of the materials. This frees the raw grind mills from dependence upon the quarry and makes the finish mills independent of the kilns. Other storage areas keep other parts of the mill operating independently, maintaining the flexibility of each production area.

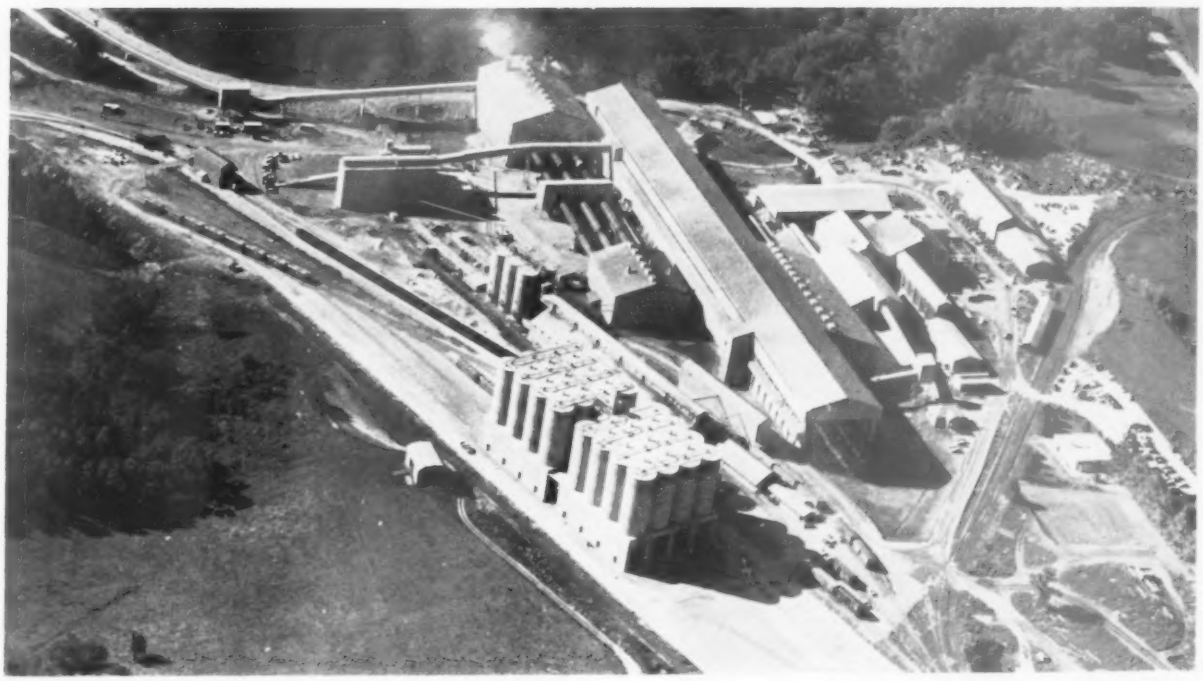
Raw ground materials from the mills are taken to a battery of 18 silos, each holding about 1,000 bbl. of material. This storage adaptability permits the grinding department to make one or more mixes of material without concern for the type being produced in the kiln department. At the same time, other raw mixes can be taken to any one of eight 1,000-bbl. reblend tanks that make the final mix before burning.

Several weeks' production from the finish grind mills can be stored in a group of 32 silos, each with a capacity of 15,000 bbl. or in the old plant storage area which has been retained. This huge storage volume enables the Union Bridge plant to ship train-loads of one type of cement at a time.

Conveyor systems. If storage is the heart of the plant, conveyor systems are the arteries. The main artery is the belt-conveyor system, almost half a mile long, that brings 600 tph. of minus 1-in. raw limestone from the quarry to the middle of the storage building; quietly, steadily, without supervision. Provision for expansion has been designed into this system, too, for this tonnage can

get there first with the most

Union Bridge, gets highly conveyorized, big-storage plant



Major sections of plant are kilns and long storage shed, plus cement silos. Crushed limestone comes to plant by conveyor at top left; coal and gypsum are delivered by rail. Portions of old plant with small kiln are at right

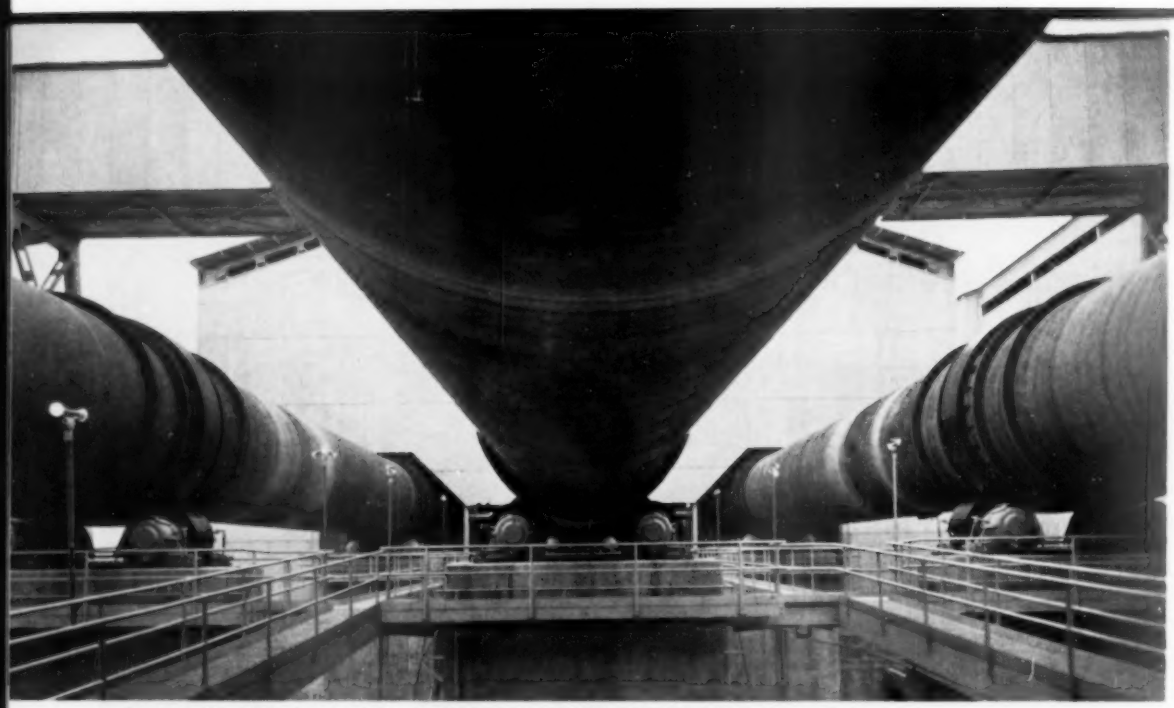
be increased without exceeding the design capacity of the belt conveyors.

Coal and gypsum are brought nearly 500 ft. to storage from a rail-car dumping building by another conveyor system. Because this system is separate from the conveyors handling limestone, either gypsum or coal can be conveyed to storage at any given time. A tripper on the coal-gypsum distributing belt puts either material in its own bins automatically and without supervision. Shale and sandstone are delivered to the crushing plant in the quarry by truck, and conveyed into new storage by the same conveyor system that handles crushed limestone.

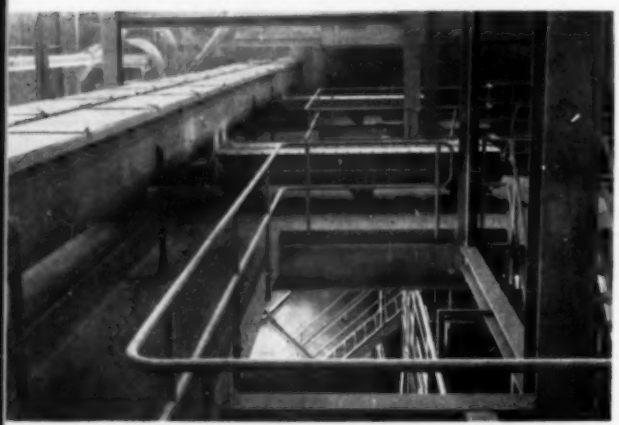
The quarry is where efficiency in raw material production starts. Two big shovels in different parts of the quarry make the first crude blending of material in the proportion specified for the cement to be made. Four 30-ton side-dumping trucks haul the marbleized limestone to the primary crusher in a programmed sequence. The crushing and screening plant is in the quarry itself. Trucks drive to each side of the crusher and the man at the crusher console dumps a full load from the trailer units. In this way, 600 tph. of mixed raw limestone can be dumped easily.

The 54-in. gyratory crusher reduces quarry-run rock to minus 6 in. A vibrating feeder under the crusher feeds the crushed rock to a 54-in. wide inclined conveyor belt, which delivers to a concrete storage hopper. This surge storage permits the secondary crushers to operate independent of haulage and primary crushing.

A huge vibrating feeder draws rock from this surge bin, feeding an inclined belt conveyor to a 7-ft. cone crusher that makes a minus 3-in. product. This material is conveyed to the screen house, where a vibrating screen removes the minus 1-in. stone, dropping it to a gathering conveyor. Oversize is taken back to the crusher building for another reduction in a 7-ft. shorthead cone crusher; the product of this crusher is conveyed to a pair of vibrating screens. Through-screen material is dropped to the gathering conveyor, and the over-

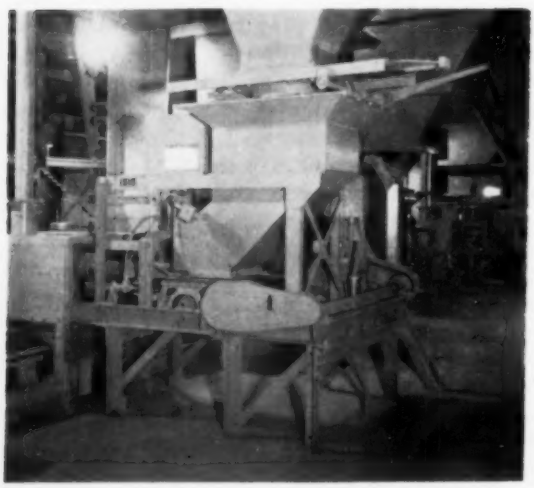


Each of the three 400-ft. kilns is designed to produce a million barrels of cement per year



Unique kiln feed loop of two large screw conveyors at left is tapped by smaller screws beneath. System improves raw blend, permits uniform kiln dust return

In the limestone quarry two rotary drills, two electric shovels and four 30-ton trucks supply 600 tph. to crusher



Weighing feeders for clinker mills vary feed rate by changing speed of feed conveyor

Key design: independent departments with huge storage

To win a market *continued...*

size is returned to the shorthead crusher by the same conveyor system that handles the oversize from the first screen.

Raw grind mills and blending. In the storage area, two overhead cranes with 6-cu. yd. buckets reclaim all materials for the next steps in the cement-making process. Crane buckets deliver materials directly to the mill bins. Coal is taken by belt and chain drag conveyors to storage above the coal mills in the kiln building. Conveyors are also provided for delivering clinker and gypsum to the old grinding mills.

Each of the three raw mills in the mill room is supplied with raw materials—shale, sandstone and limestone—through a weighing-feeding system that is governed by the volume of recirculating materials in the grinding circuit. The total volume of the three feeders is set to maintain an output of about 50 tph. from the mill. Each mill is in closed circuit with an air classifier provided with oil-fired furnace to permit combination drying and classifying.

The fine, finished mixture is discharged by the air separator above each mill to a gathering conveyor which delivers the combined stream to a pneumatic conveying system for the trip to the concrete storage and blending silos some 500 ft. away.

Screw conveyors give excellent mixing and blending of raw materials drawn from the silos that have been selected to make the mix for kiln feed. A rotary feeder under each of the 24 silos feeds a screw conveyor. This conveyor, running under each row of blending bins, delivers into a cross conveyor discharging into a pneumatic conveying system which transports the raw material into any one of eight reblending bins. Normal practice is to use four bins for feeding the kilns while refilling the other four from the blending bins. Kiln feed is transported by a pneumatic conveyor to two large kiln feed tanks 200 feet away.

Kiln feed and burning. These two tanks are the anchors of a unique "feed loop" that keeps the kilns supplied with a continuous, uniform supply of feed material. One tank is just east of the three kilns; the other, west. Each tank discharges continuously into a bucket elevator. The elevators load two screw conveyors high in the kiln building. These take the material from one tank to another. Each of the two conveyors is tapped by a pair of kiln feed screws which are synchronized with the speed of the kiln. Material not used for kiln feed is returned to the tank opposite the one it came from. Once the optimum feed rate has been set manually, the motors of the screw feeders are controlled by the kiln speed.

All dust from the dust collectors is introduced into the feed loop continuously. The screw conveyors that gather the dust finally discharge into the boot of the east elevator. By the time the dust reaches the first takeoff screw, it has been mixed thoroughly into the raw feed.

Each 11½ x 400-ft. coal-fired kiln can make about 3,000 bbl. of clinker per day. Each operates between 60 and 65 rph.

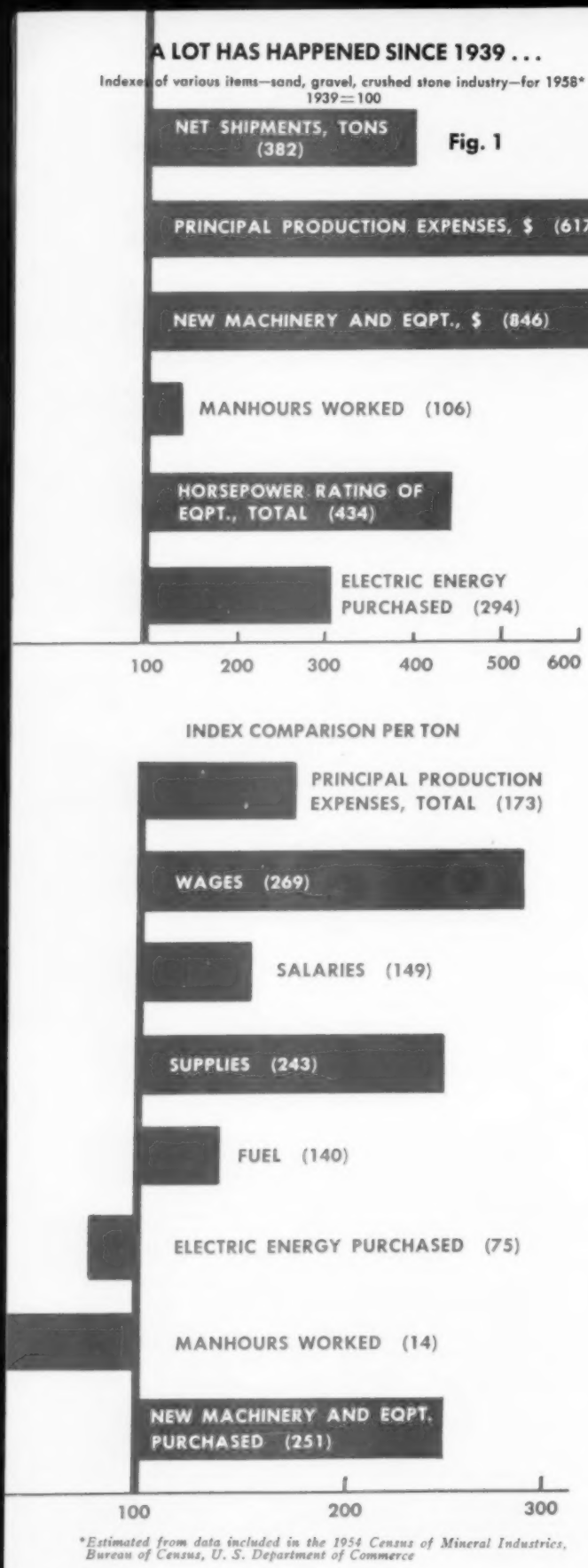
Coal handling is as automatic as the designers could make it. Once the crane operator in the storage building places coal in the reclaim hopper, instruments take over. The fuel is fed to a conveyor system, weighed and stored above coal mills without further attention. Milling and firing of coal takes place continuously and automatically.

To collect dust, both mechanical and electrostatic types of collectors are used in series. As the exhaust gases leave the kilns, they are in the

Please turn to page 152

MAJOR EQUIPMENT IN UNION BRIDGE, MARYLAND PLANT

In Quarry:	
Shovels (3)	
492-3 cu. yd.	Marion Power Shovel Co.
75B-2½ cu. yd.	Bucyrus-Erie Co.
110B-4½ cu. yd.	Bucyrus-Erie Co.
Drilling machines (2)	
56BH	Joy Mfg. Co.
58BH	Joy Mfg. Co.
Haulage trucks (4)	
DW20 tractors	Caterpillar Tractor Co.
30-ton trailers	Easton Car and Construction Co.
Crusher, primary, 54-in. gyratory	Traylor Engineering and Mfg. Co.
Crushers, secondary (2)	
7-ft. standard	Nordberg Mfg. Co.
7-ft. shorthead	Nordberg Mfg. Co.
Belt conveyors (10)	Chain Belt Co.
In Mill:	
Raw mills (3)	The Babcock & Wilcox Co.
Bucket elevators (3) Clinker Hauling	Chain Belt Co.
Bucket elevators (4) Raw material	Link-Belt Co.
Oscillating raw material conveyors (2)	Carrier Conveyor Corp.
Oscillating clinker conveyors (6)	Carrier Conveyor Corp.
Pneumatic conveyors	Fuller Co.
Clinker cooler	Fuller Co.
Cement pumps	Fuller Co.
Kilns (3), 11½ x 400	F. L. Smidth & Co.
Coal mills (3)	F. L. Smidth & Co.
Clinker mills (3), 9½ x 26, 2-comp.	F. L. Smidth & Co.
Dust collectors, electrostatic	Koppers Co.
Dust collectors, mechanical	Western Precipitation Corp.
Coal conveyors	Chain Belt Co.
Overhead cranes	Harnischfeger Corp.
Plant motors	Westinghouse Electric Corp.
Plant design	Lehigh Portland Cement Co.



Estimated from data included in the 1954 Census of Mineral Industries, Bureau of Census, U. S. Department of Commerce

Fig. 1

Efficiency is the keynote as

Aggregate

THE AGGREGATES INDUSTRY has a big problem—how to operate efficiently enough to make a satisfactory profit. A study shows that the industry has handled this problem pretty well, since the productivity rate—based on the use of labor—has shown considerable improvement. But here's the fly in the ointment: each year it is costing the industry more and more to get improved efficiency.

How to find the answer to the dilemma is taxing the ingenuity of management and equipment manufacturers alike. And it's becoming more and more vital to find an answer, since most aggregates producers are in the business for more than just the fun of it. Ask some producers—as we did—why they think they should increase the efficiency of their operations and you get a quick reply: "We've simply got to improve our operations, or fail." Ask others, and don't be surprised if you get another answer that we got, "To keep from starving." It really is that serious in some cases.

At the first of this year ROCK PRODUCTS prophesied that "efficiency" would be a big word this year, that it would get the nod as a major accent in production. (see ROCK PRODUCTS, Jan. 1958, pp. 15). This was not a hard prophesy to make, and a recent RP survey—reported in the following pages—proves its accuracy.

Aggregates industries, and the individual producers in them, were quick to see a potential mushrooming demand for their products in coming years. Also, they were astute in getting ready for that growth as far as producing facilities are concerned. But they ran smack into the weighty problem of rising costs and an ever-narrowing profit margin brought about by competition. The problem had to be licked if the demand for aggregates —to be so important to the growing economy—was to be met. So, an aggressive program was developed; producers rolled up their sleeves and got to work on ways of improving production.

"Efficiency" is the word commonly applied to the results obtained from production improvement. What is efficiency, and how do you get it?

Efficiency is the quality that produces the best business results or the most effective service. It covers not only improvement in a productivity

producers battle rising costs

rate, but in every phase of operation involved in doing business—every operational phase from mining and quarrying through sales. It covers all subsidiary phases such as maintenance, power, safety, public relations, management, etc., even advertising.

But speaking only of a better productivity rate, rarely, if ever, does it come from application, effort or efficiency on the part of the individual worker. Rather, worker efficiency is induced through the expenditure of money, time, effort and ingenuity by management.

Two fallacies in the aggregates production industry are thus pointed up:

(1) That it is equitable for labor to base high wage-increase demands on an improving labor-productivity rate, in an effort to gain its "share" of improved efficiency.

(As a major factor of input into the economy of the industry, labor is entitled to a fair share of the improvement that higher efficiency brings, but certainly not all nor even a sizable portion, since its contribution is relatively small.)

(2) That the measure of production improvement (efficiency) should be gauged most prominently on an increase in units of output based on the use of labor.

(Under the true circumstances, wouldn't it be more pertinent to measure improvement in the units of output based on the use of capital and management ability?)

A real measure of total operational efficiency shows up on the cost sheet. An increase in the labor-productivity rate may result in a decreased unit cost per ton, which may improve the competitive position of the producer or it may improve his profit position. But it may not. Assume that the productivity rate has jumped 10 percent. At the same time, however, assume that cost of supplies, capital investment, maintenance and repair parts, taxes and all costs other than labor have increased at a more rapid rate. The result may be an increased unit cost per ton of production.

It is imperative, then, that the so-called productivity rate be increased, and that it be raised more than the amount it costs to get it, or production improvement dies on the vine. That's the problem that faces the aggregates industry today.

Industries have made progress. Available data show that the aggregates industries have done well by increasing the labor-productivity rate 264 percent in the past 19 years. This rate has not kept up with total shipments, however, which have jumped 282 percent in the same period. Additional data for the 19 years show that the average size of quarries and mines, in annual tons, has risen 74 percent; the average number of production employes per quarry or mine has dropped 27.5 percent; average output per man year has jumped 165 percent; and that average number of man-hours worked per production employe has fallen 26.4 percent.

These data are based on information contained in the 1954 Bureau of Census report on the sand and gravel and the crushed stone industries, which currently account for more than a billion tons of output annually. Comparisons were made, on the basis of published data, for the years 1939 and 1954. Simple calculations made adjustments of data to arrive at indexes for 1958. No consideration was given to dollar inflation in calculations.

No production figures were reported in the 1954 Census report; instead, tons were reported as net shipments in each case. These data are assumed to be production figures, since other comparable figures for production are not available. Data for employes are limited to production, development and related workers up through the working foreman level; supervisory employes above that level are excluded.

In every case of comparison, 1954 indexes of data were calculated using 1939 as the base year. It was assumed that the average annual rates of increase or decrease held for the 1954-1958 period, to arrive at computed indexes for the year 1958. To be sure, the calculated data for 1958 may not be entirely accurate, as far as figures go. But we feel that they are accurate enough to use as the basis for certain conclusions drawn from comparison of related items.

The sand and gravel industry has not kept up with the pace in productivity increase set by the crushed stone industry during the past couple of decades. Although more tons of sand and gravel have been shipped during the period than tons of crushed stone, shipments per man hour have increased at only half the rate for sand and gravel as that for crushed stone (see Table 1). That there is a greater number of smaller operations, each

There Have Been Many Advances In 20 Years

TABLE I (Indexes; 1939=100)	1958 Sand & Gravel Industry	1958 Crushed Stone Industry	1958 Combined Industries
No. of mines, pits or quarries	319.1	128.7	219.0
No. of production and development workers	220.3	109.0	144.6
[illegible]	[illegible]	[illegible]	[illegible]
No. manhours worked	203.8	73.7	105.8
Average size of mines, pits or quarries	127.2	295.0	174.0
Average no. production employes per plant	63.0	84.1	72.5
Average no. manhours per man year	91.4	78.3	73.6
[illegible]	[illegible]	[illegible]	[illegible]
Average shipments per manhour	203.6	472.4	363.6

employing fewer production workers, in sand and gravel than in crushed stone, has a bearing here. A major reason is the fact that number of manhours worked in the crushed stone industry has fallen 26.3 percent since 1939, whereas those for the sand and gravel industry have increased 103.8 percent.

Other comparative data on the two industries and the combined industries, in indexes based on 1939, are shown in Table 1.

Now, let's look at how dollar expenditures have grown! All of the major expenses involved in production have grown dollar-wise at terrific rates—some of them nearly eight times since 1939. The Census Report lists several categories of major expenses. Wages and salaries represent gross earnings and include all forms of compensation. Supplies include all charges made, and include freight charges where applicable. New machinery and equipment expenditures include those made for replacement purposes, as well as those for additions to capacity. Costs of maintenance and repairs are excluded.

Dollar expenditures by the combined industries for principal production expenses show a 516.8 percent jump over the 19-year period, or an average increase of 27 percent per year. Of course, part of this is due to inflation. Assuming that a 1958 dollar is worth only 48 percent of a 1939 dollar, the calculated increase in 1939 dollar expenditures a year drops to about 7.5, which is considerable, indeed. Yet, the actual dollars spent for major items of production expense have to be related to actual dollars in profit and loss today, since the Internal Revenue Service does not figure income in terms of 1939 dollars. Reference to Table II makes it easy to pick out the unusually high items: supplies, new machinery and used equipment. Compare these increases with labor-productivity increases over the same period and you'll see why it is important to stress a productivity figure based on capital expenditures and management ability.

The cost-per-ton data, also shown in Table II, show a better picture as far as figures go. Yet they show definite increases and point up the advantage of increasing the labor-productivity figure. Note that the index for wages of production workers, combined industries, shows the highest per-ton cost increase of all items. The other three mentioned above—supplies, new and used equipment—remain high even on the basis of unit cost. The unit cost for purchased electric energy is the only figure that shows a decrease during the period.

The need for increased energy applied toward production improvement in the sand and gravel industry is evident from data in Table II. However, the picture may be distorted some because the 1939 unit cost per ton for principal expenses in the sand and gravel industry is just about half that for the crushed stone industry that year. Sand and gravel was low to begin with. But the data indicate that, today, the unit cost for crushed stone is still 50 percent more than that for sand and gravel. The actual estimated increase in cents per ton for principal expenses during the 19-year period is comparable for both industries.

What assumptions can be made, based on the experience of the aggregates industries over the past two decades? The one major evaluation is that production efficiency has made some sizable gains, but the cost of getting that improvement has skyrocketed! This is news to no one. There is some relief from the fact that the value of shipments also has increased considerably, but not to the extent that costs have risen. The result is that the heavy hand of a cost-price squeeze is on the shoulder of the aggregates producer, and he must spur himself to more effective production improvement if he is to survive.

But Expenditures Have Skyrocketed

TABLE II (Indexes; 1939=100)	1958 Sand & Gravel Industry	1958 Crushed Stone Industry	1958 Combined Industries
Dollars for:			
Principal production expenses	787.8	519.3	616.8
Wages of production workers	832.0	466.0	592.6
Salaries, all other	600.2	439.0	514.2
Supplies	953.6	669.9	763.6
Fuel	575.0	445.1	509.3
Electric energy purchased	314.0	281.2	294.0
New machinery and eqpt.	895.2	799.0	846.2
Used equipment	948.4	644.8	799.2
Cost per ton for:			
Principal production expenses	218.3	151.9	172.7
Wages of [illegible]	234.4	211.3	228.6
Salaries, all other	167.0	122.2	149.4
Supplies	261.0	196.9	243.0
Fuel	155.6	126.8	140.4
Electric energy purchased	77.2	71.9	74.8
[illegible]	256.5	184.1	231.0
Used equipment	267.2	189.8	228.2

Data to support this contention are included in Fig. 2 and in Fig. 3 on the following pages. The sand and gravel industry, although showing progress, is behind the crushed stone industry in getting effective results thus far.

Looking at the rate of expenditures a producer must make to get an increase in productivity, we find some startling comparisons. These are based on the experience indicated by the Census report over the 19-year period. The following table shows what percent more in dollar expenditures you have to make in 1958 for some items to get one percent increase in the labor-productivity rate (tons of shipments per production worker hour).

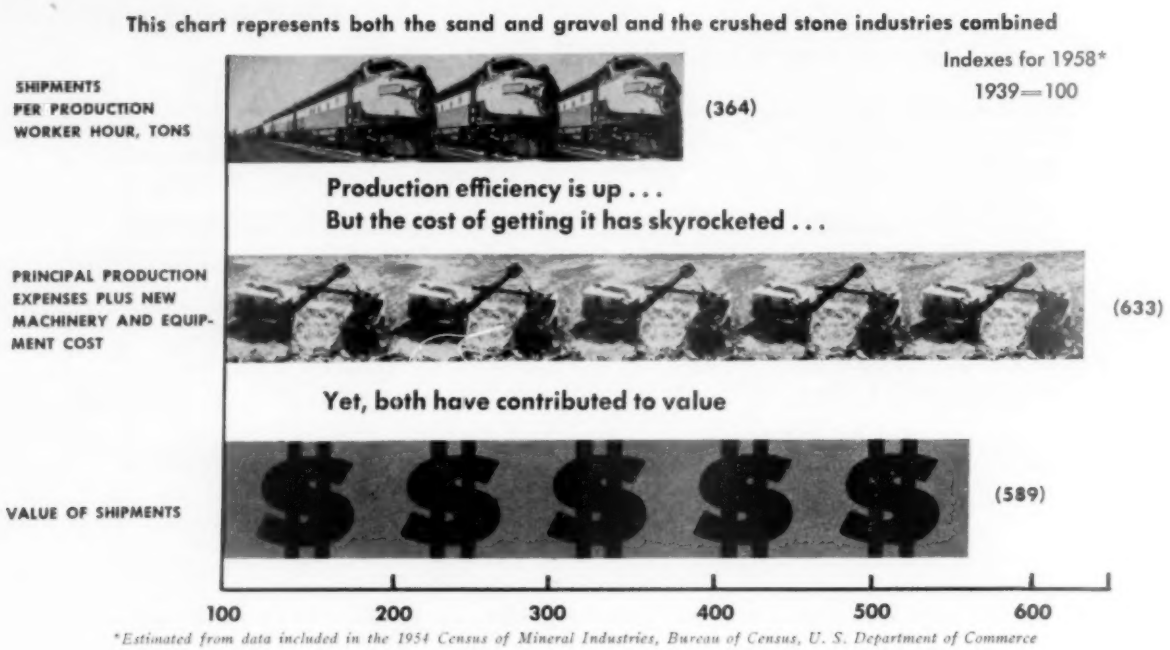
	Percent Increase in Dollar Expenditures To get One Percent Increase in Productivity		
	Sand and Gravel	Crushed Stone	Combined
For new machinery & equipment	4.41	1.68	2.33
For principal production expenses	3.87	1.10	1.70
For wages	4.08	.99	1.63
For supplies	4.68	1.42	2.10

The data actually show how expenditures for certain items in dollars have grown since 1939, compared to the growth in productivity rate. Can we assume, from the combined industry data, that it is getting to be less and less efficient to add new machinery and equipment? Certainly not! Imagine the relationship between expenditures and productivity increase if no machines had been applied during the period. The result would have been a definite absence of industry progress. Yet, the above data do point up the possibility and advantages of improving the ratio of return in productivity increase from capital spending. Wouldn't it be a boon to aggregate producers to get even a 2-percent jump in productivity for every 2⅓-percent rise in capital spending for machines—just double the above rate?

But this relationship doesn't tell the whole story. Addition of new machines does more than give an assist to improving the productivity rate. Use of new, improved equipment makes possible the upgrading or improvement in product. For example, while costs for new machinery in the combined industries raised productivity in the ratio of 2.3 to 1, value of product increased in ratio to productivity as 1.6 to 1. In simple terms, product value increased 1.6 percent for every 1 percent increase in productivity. The comparable figures for the sand and gravel and crushed stone industries are 3.37 and 1.11, respectively. So, the improvement in value has been much greater for sand and gravel, somewhat offsetting the lower improvement in productivity rate in that industry.

There are other benefits, too. Application of new machinery and processes tend to reduce labor, maintenance, power and other operating costs. Housekeeping, safety and employe morale are improved. Also, new equipment tends to contribute to constant trouble-free plant operation and the attendant benefits therefrom. Balance the benefits with the costs and the answer is apparent. It is mandatory to continue improvement in operations through additions of new processes and equipment, to maintain a competitive position.

Producers active in finding solution. There are no quitters among aggregates producers. They know their problems and they're fighting hard to



Estimated from data included in the 1954 Census of Mineral Industries, Bureau of Census, U. S. Department of Commerce

whip them. We know, because they've told us so. Realizing, as producers do, that the recession has thrown some hard rights in the way of production, cost and price problems among them, we went straight to them to find out how they're taking the punches. They're not down for the count yet—by a long way!

Producers are spending money to whip the production improvement problem, and no phase of operation is being slighted in the attempt. "Of course," they say, "we're increasing our effective use of labor. We have to." By far the majority of producers who answered our survey told us they were increasing the effectiveness of production machines. More than that, four out of five said they already had future plans to do more of the same. To them, the business of improving production efficiency is far more important now than expansion. They've been on their toes, evidently, since nearly half of those answering our survey said they already had expanded in anticipation of the bigger demand in years to come. But the average producer, according to our survey, is spending at the rate of $70,000 per year for capital expenditures and to otherwise improve efficiency. Cost of expansion per annual ton of capacity, they say, is 50.8 cents. The reported range in this cost is pretty wide—from 15 cents to $1.35 per ton.

Here's how the answers came through.

Are you spending money to improve production efficiency? Of those that replied, 83.1 percent said they were. We didn't ask them but we know that some of those that answered "no" to the question already had spent some money to improve. Such comments were volunteered.

How much have you spent for that purpose? The sand and gravel producers who replied said they spent an average of $26,700 a year. The average for crushed stone producers was a little higher—$43,300. Average for the combined industries was about $30,000 a year.

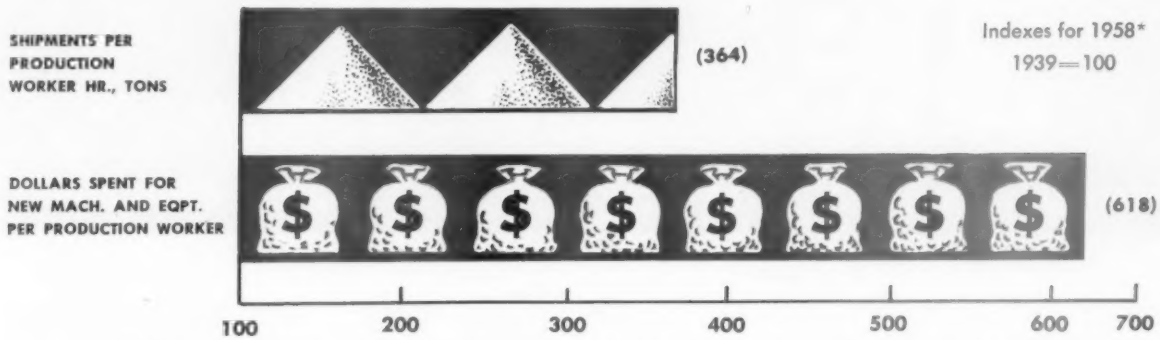
In what phases of production were efforts made to improve efficiency? The answers here ran all over the lot, as it can be assumed they would. This shows that producers realize nothing can be overlooked when looking around to find places where costs can be cut and productivity improved. Quite a few producers were all-inclusive in their answers (14.5%), noting "general production" as their answer. Screening, quarrying, crushing, haulage and stockpiling each accounted for 10 percent or more of total answers. This would imply that those categories are getting the strongest attention among those that replied to the survey. Other phases mentioned specifically included maintenance, new equipment, washing, classifying, power and pumping.

Did you increase the effective use of labor in 1957-1958? Apparently, those who spent money to improve efficiency had good results, for 74.6 percent of the producers who replied said that they did; 83 percent said they spent money to do so. The result was a little better for the sand and gravel industry, since 78 percent said they raised labor efficiency, compared to about 71 percent for the crushed stone industry.

How did you increase labor efficiency, and what were the savings? We specifically set forth two major suggestions in the questionnaire: (1) reduce payroll with the same amount of production,

THERE ARE TWO WAYS TO LOOK AT PRODUCTIVITY

In terms of use of labor and in use of capital



This chart represents both the sand and gravel and the crushed stone industries combined

**Estimated from data included in the 1954 Census of Mineral Industries, Bureau of Census, U. S. Department of Commerce*

or (2) increase output with the same number of men. The answers for both industries combined showed that 32.8 percent used the former method, 47.6 percent used the latter method, and 19.6 percent used other methods. The accent was on improving efficiency with no reduction in payroll. This held also for the two separate industries. However, 25.1 percent of those in the crushed stone industry said that they maintained output with a reduction in payroll, compared with 43.8 percent for the sand and gravel industry. It is evident that there were more layoffs in the sand and gravel industry.

The savings achieved with both of the above methods ranged widely. In those cases where labor efficiency was improved through reduction in payroll, savings were reported from 2 to 25 cents per ton. Those that increased output with the same number of men reported savings through increases in output that ranged from 8 to 100 percent. The 100-percenters really should have shown a terrific reduction in cost!

What is your productivity rate per unit of labor (tons per man day)? The replies to this question were both intriguing and mystifying. Although we offered no specific formula for computing the rate, we did specify that man days should be based on production workers exclusive of management, supervisory and office workers. Without knowing, we feel that either the reports were faulty in some cases or that some were doing a terrible job in production. An added unknown factor, of course, is the relative natural conditions under which a mine, pit or quarry is being operated. Nonetheless, consolidated answers for the combined sand and gravel and crushed stone industries showed an average of 105 tons per man day with the extreme broad range of 7 to 666 tons per man day. It is apparent that more study should be given to an analysis of productivity rates in the industry.

The sand and gravel industry reported an average of 175 tons per man day as the average productivity rate of production workers. The range was almost unbelievable: from 45 to 666 tons per man per day. The replies from the crushed stone industry showed an average of 69 tons per man day, also with a wide range of 7 to 200.

What did you do to improve the efficiency of your production machines in 1957-1958? This question was divided into two suggested methods: (1) provide new, more efficient machines, and (2) gain more efficiency out of installed equipment. Combined industry replies showed that 54.7 percent used method 1, that 40.6 percent used method 2, and 4.7 percent used other methods. Both producing industries preferred to the same extent the method of purchasing new machines to increase machine efficiency. The proportion of sand and gravel operators using the method was 55.5, compared to 56.6 for the crushed stone producers.

Do you have additional plans to improve efficiency of machines in the future? Answers to this question were most encouraging. The great majority (80.4 percent) had further plans for improvement, indicating that they believed continued emphasis must be placed on machine efficiency. The proportion that answered "yes" to this question was a little higher for the sand and gravel industry than for the crushed stone industry. This is a clue to the fact that a greater job must be done in sand and gravel, if past experience according to the Census report is valid.

How can manufacturers of equipment help increase the efficiency of machines? Our question was not worded just that way, but practically all the answers fit this wording better. Here, we get an insight on the importance the equipment manufacturer plays in production improvement, at least in the eyes of the producer. Answers ranged all the way from "They are doing a good job" to downright beefs. The most prominent suggestion (30.8

Please turn to page 144

1. Portable plants

2. Bigger equipment

These trends are cutting rock plant costs

Top items are portables, bigger equipment, public relations, washing

IN RECENT YEARS producers and the equipment people have made many improvements in aggregates plant design. Several trends in equipment and business management are particularly evident.

First is the use of **portable plants.** They are very popular because they cut hauling costs from distant quarries and add flexibility to their owners' operations. Because producers want to get closer to remote highway and construction projects, and because many contractors are using them, the trend to portable plants seems sure to continue. ROCK PRODUCTS' research department estimates that at least 1,100 portable aggregates plants are in use by producers alone.

The trend to **bigger equipment** has been going on for years. Principally because big equipment works faster and cuts labor requirements, the trend is sure to continue for all types of rock producing equipment.

Reaping indirect benefits for producers is the push for better **public relations,** including safety programs, land reclamation (see picture), open houses and active participation in zoning proceedings. Partly because the associations are pointing up their value, safety programs are being more widely adopted. A better safety record not only means fewer lost working hours, but also better employe morale. Public relations programs encourage communities to look sympathetically at producers' problems.

A fourth trend is the **upgrading of marginal deposits** by removing deleterious material like shale, wood and coal. By making possible the use of low grade deposits, developments like heavy media separation, jigs, impact fractionation and the hydraulic rising-current classifier are catching the eye of many producers.

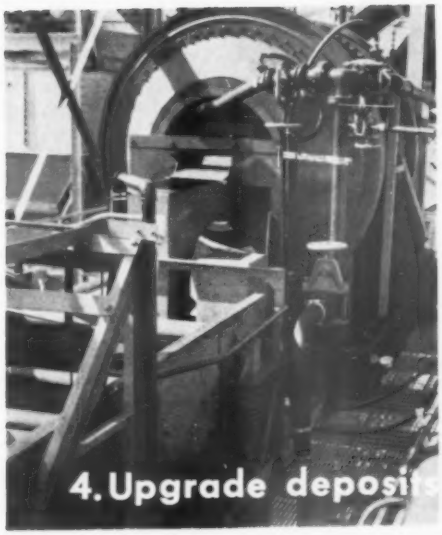
Highly accurate **control of feed** to crushers, screens and even conveyors is a fifth trend. Because costs for labor and equipment are rising, accurate feed is necessary for equipment to be run at optimum load. Weighing feeders, vibratory, wobbler, plate and belt feeders are major types.

Another trend, an important one, is the growing use of **washing equipment** to meet stiffer specifications. In a series of articles beginning in August, 1958, ROCK PRODUCTS, author William A. Rundquist quotes highway specifications to show that washing is now often a necessity, even for crushed stone. Such equipment as coarse and fine material screws, log washers, rotary scrubbers and now the liquid cyclone for fines are popular for aggregates washing.

To illustrate these trends we have gathered examples of profit-boosting new equipment and techniques now being used in the aggregates industries. You will find them on the following pages. This section could have some money-saving ideas for you. At the end of the section you will find examples of brand new equipment at work and some top maintenance ideas.

Please turn to page 100

3. Public relations



4. Upgrade deposits

5. Better feed control

6. Aggregates washing

Trend

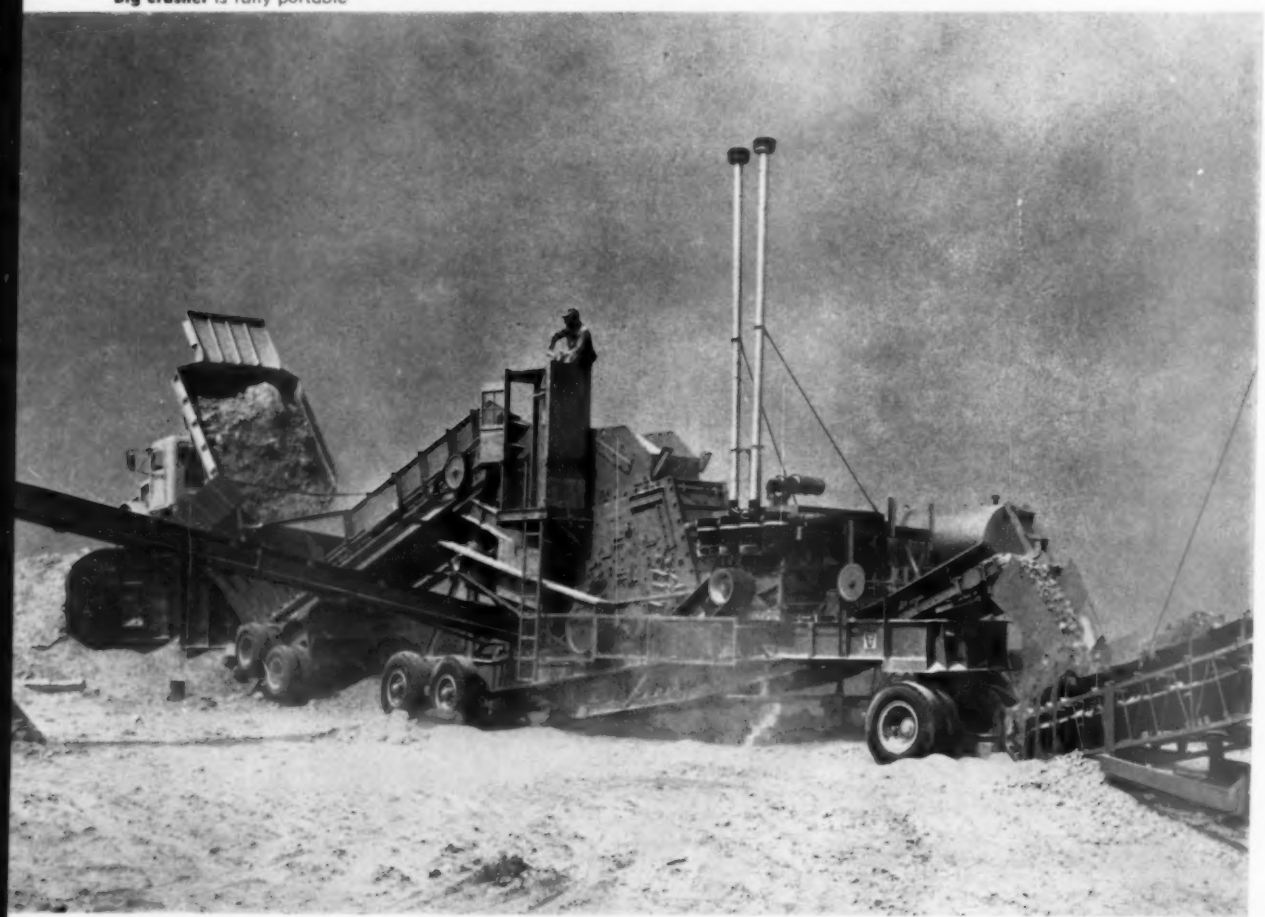
1 Use of portable plants

THE VALUE OF **portable plants** in meeting far-flung, one-shot aggregates jobs was proven by a portable unit which supplied 580,000 tons of rock for the Kansas Turnpike in 1956. Because the previous summer it had worked filling a similar contract for the Ohio Turnpike, the entire plant had to be shipped 1,000 miles to the new job during the winter of 1955-1956. The contract was filled by a portable aggregates plant owned jointly by T. L. James Co. of Ruston, La., and R. W. McKinney, Nacogdoches, Texas.

Others find portables valuable, too. Vern Hamlin of Straits Aggregate and Equipment Co., Millersburg, Mich., says that his firm's portables "really extended our operation. Production-wise and geographically, they've opened up new territory, because we can move them fast and do anything from small to big jobs. They've opened up new winter work for our men, too, because many times we can pick up sub-base jobs."

Straits Aggregate likes to use its stationary plant solely for making washed aggregate during the seven warmer months, since it is more profitable business. But its top customers often needed base rock during this time, and obviously could not be refused. Now the portable plant makes the less profitable base gravel, while the stationary unit is free to make washed aggregate. See ROCK PRODUCTS, March, 1958, for the story of the firm's stationary and two portable plants.

Big crusher is fully portable



Trend

2 Bigger Equipment

Huge 50-ton rear dump is used for quarry hauling

OFTEN A BIGGER PIECE of equipment will save a producer money because its higher productivity more than offsets its higher cost. Material Service Corp. found this to be true in the quarry hauling operation at its Thornton, Ill., quarry. The company reports that production was boosted 30 percent in three years by switching from rail cars and 27-ton trucks to **50-ton diesel rigs.** Now eight of the 50-ton Dart trucks replace 12 smaller units and the rail system.

One producer discovered that a **large down-the-hole rig,** making 700 impacts a minute and drilling up to 33 fpm., will completely replace four smaller churn drills, a crew of five and a truck. The new Ingersoll-Rand unit paid for itself in a year.

At the Shelbina Quarry of Hall & Riley Quarries and Construction Co., Boonville, Mo., operating men found that a new, more powerful **wagon drill** of 2¾ in. worked faster than their earlier units. It drilled into their Burlington limestone deposit at about 8⅔ fph., or over one-third faster than the 6-fph. rate of the 2¼-in. wagon drill it replaced. The change, plus a switch to a new explosive and wider hole spacing, cut drilling time by 71 percent. In fact, the firm found that the new Gardner-Denver drill completely took over the work of the two units previously used.

Two new loaders are saving time—and thus money—for their owners. The first, a **5 ft. wide belt loader** for trucks, can load a 19-cu. yd. off-highway hauler in less than 20 sec. This big Kolman unit is clearly a time-saver where large stockpiles must be removed.

To speed loading of barges with its crushed stone, New York Trap Rock Corp. has installed a **conveyor system** to load its more than 200 barges plying the Hudson River. Replacing an inadequate chute system, the loader features a shuttle conveyor which moves back and forth over the barge to spread the load evenly. Another apparatus on the loader uses a winch to move the loading barge past the conveyor overhead. One man controls this Hewitt-Robins unit.

Please turn to page 104

Belt loader, 5 ft. wide, loads hauler in 20 seconds

Barge loader spreads load evenly

Gravel and quarry operators rely on modern CAT power for the jobs that are hard and have to get done on time!

"Always use Cat power in the shovel. These engines are long on life and trouble-free."
—GEORGE PATTON, President, Calcite Quarry Corp.

"Very well satisfied with low operating cost and high production of our Cat Engines."
—FRANKLIN TURNER, Turner Lime and Rock Quarry

"Fits our dredge for power and size; when you set this Cat Engine, it will hold its RPMs."
—ERNEST HANSON, Supt., Frazer & Sons Inc.

"Like our Cat Engine's dependability and power, and we get real good service."
—JOHN ROFF, Supt., Coon Valley Gravel Co.

LIKE thousands of others, these owners and superintendents use Caterpillar Engines for the tough jobs, because they *must* have dependable power that keeps other equipment working full time.

To amplify just one of the above statements, Mr. Patton of Calcite Quarry Corp. of Lebanon, Pa., has good reason to be sold on Cat power for his shovels. The engine in his Lima, a Cat D11000, was installed in 1933 and is still producing big. Calcite purchased this shovel in 1942 and the engine hasn't required an overhaul by a Caterpillar Dealer since then! And since 1942 it has provided power to load more than 3 million tons of high-calcium rock. For one two-year stretch it operated 16 hours a day around the calendar handling hard rock in choke-dust conditions!

Because Cat power units are reliably rated and built to take the gaff, you often see them widely used on a single job. And for the same practical reasons, you find more and more job-wise contractors buying Cat Engines to *repower* equipment that won't produce as it used to.

Cat Engines feature a 4-cycle design for smooth, efficient power. Fuel nozzles won't foul under changing load conditions, and Caterpillar's exclusive precombustion chambers save money by burning *all* the fuel *all* the time—even low-grade No. 2 furnace oil. The exclusive cast-in cast iron top ring band of the aluminum alloy pistons gives the durability of cast iron and the light reciprocating weight of aluminum for longer life. It all adds up to a power package that won't let you down and costs less to run.

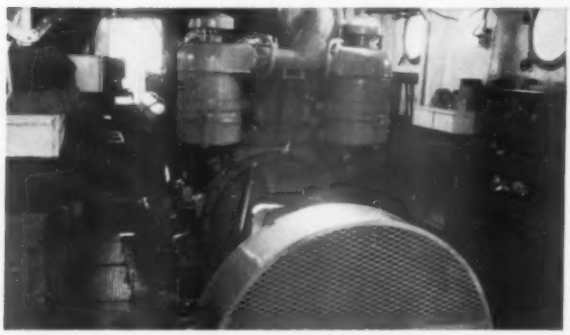
Wherever you buy, Cat power can be supplied. And *when* you buy, Caterpillar Dealer service is assured. So see your nearby Caterpillar Diesel Engine Specialist soon about your power needs. Review your power line-up now and save down time later.

Engine Division, Caterpillar Tractor Co., Peoria, Ill., U. S. A.

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

A Cat D4600 Diesel Engine powers this Chicago pneumatic air compressor, used for drilling blast holes in lime and rock quarry at Shelbina, Mo. The owner of the Turner Lime and Rock Quarry says, "I have increased production and profits since standardizing on Caterpillar products." Quarry is 100' deep and 2 acres big. Cat Engines keep all your equipment working full time.

The Calcite Quarry Corp., Lebanon, Pa., has used the D11000 powering this Lima shovel hard since 1942 — "So," says President George E. Patton, "you can see this Cat Engine has proven its worth, giving us many years of trouble-free service at low operating cost." Rock taken from quarry near Lebanon is used as fluxing and in cement. Heavy-duty Cat Engines have negligible down time.



This modern heavy-duty Cat D397 Diesel drives a 12" Georgia Iron Works pump for dredging operations on a flood control project in North Palm Beach. One reason Superintendent E. R. Hanson bought Cat power was the "reputation of Caterpillar products."

Supt. John Roff, of the Coon Valley Gravel Co., bought Cat Engines for this job near Des Moines because "It's the best engine made!" Besides a D375, a D318 and a D8800, on the job, a Cat D397 Diesel drives an Amsco pump for this sand dredger.

ENGINE POWER BY CATERPILLAR

YOUR CATERPILLAR DEALER

has excellent service facilities to back your engine investment. 844 parts and service outlets throughout 125 countries of the world are strategically located to keep your Cat products earning for you. Here a diesel service specialist checks a fuel injection valve nozzle for proper performance.

Engine Division **Dept. RP9**
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Send me more information about Cat Engines for original power and repowering.

- ☐ Have your dealer call for an appointment, as I may be in the market for a Cat Diesel Engine or Electric Set. I understand that I am under no obligation.
- ☐ I am interested in learning more in general about these engines.

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Company _____

Address _____

City _____ *Zone* ____ *State* _____

Reclaimed pit will soon be a beauty spot

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Value Them . . .
You are one of the joint owners of more than $100,000,000 worth of school property. In 88 schools, 72,492 children are being trained for citizenship and for loyalty to their city, state and nation. This makes your schools of extreme importance to you and to the welfare of Cincinnati. Value your schools.

Support Them . . .
Since 1828, the citizens of Cincinnati have given more than a million children the advantages of free public education. A strong nation must have good schools. Today, as never before in their history, your schools need the keen interest, intelligent understanding and active support of every citizen. Support your schools.

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Sample public service ad

Public relations programs

PUBLIC RELATIONS PROGRAMS are now common in the aggregates industry, so it was no problem to find several to illustrate what is being done.

Ohio Gravel Co., Cincinnati, tells of the company's value to the community by using the indirect approach. Its public relations **ads in the newspapers** push worthy projects such as the metropolitan highway program and the public schools. But there is a catch—all use aggregates.

Ohio Gravel also set a fine example with its **land rehabilitation** program. Its president, Fred W. Cornuelle, bought two abandoned gravel pits from the company and turned them into parks for fishing and recreaion. Mr. Cornuelle is enthusiastic: "These projects have generated favorable public opinion towards the gravel industry."

American Aggregates Corp. is another leader in land rehabilitation—it has to be. Its 17 midwestern plants eat up land at the rate of about 250 acres a year. President William E. Hole is sure that the aggregates industry must practice rehabilitation. "Unless the whole industry can demonstrate to the public and zoning officials that sand and gravel operations will not result in a permanent blight on the landscape," he says, "we can expect harsh legislation and adverse zoning." The firm has rehabilitated several worked-out deposits.

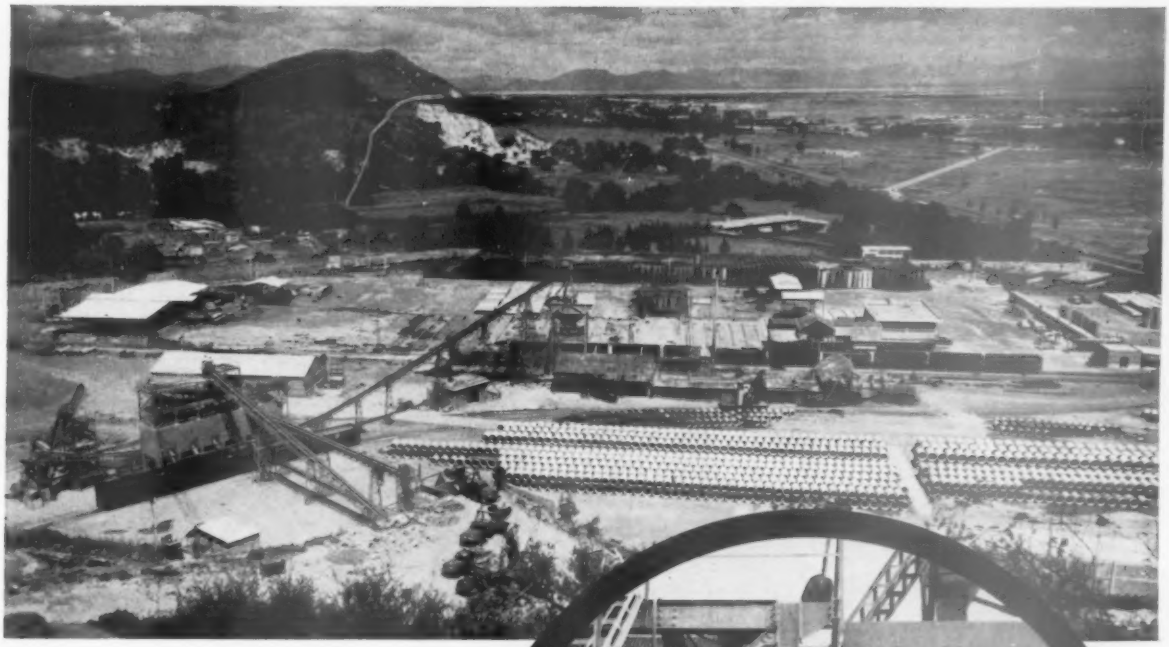
The vital importance of **safety programs** is sometimes overlooked. But the Southern California Rock Products and Ready Mixed Concrete Associations have not neglected this aspect of public and employe relations.

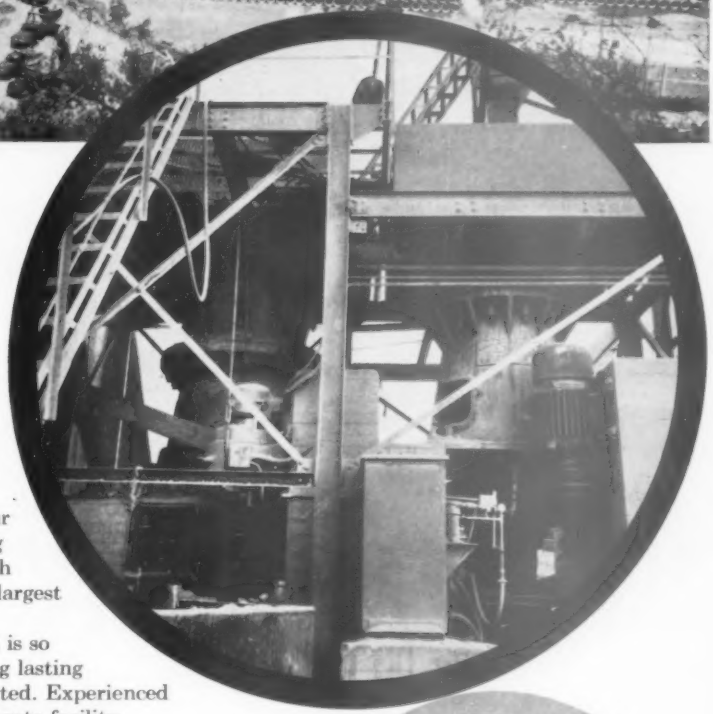
Crowd at open house scrambles over plant

After their program was set up 3½ years ago, the 27 member firms had their supervisors get a detailed report of each accident. The most common types of accidents were studied and the trouble-making problems corrected. A monthly "Safety Sentinel" was posted in each plant for the employes. Result? Total injuries dropped to 120 in 1957, just over half the number in 1956. Where 21 of the 27 firms had one or more accidents 3½ years ago, now only three reported any.

Many plants give yearly **open houses** to keep on friendly terms with their neighbors.

Please turn to page 109





another complete

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AGGREGATE PLANT

Six hundred meters of concrete pipe are produced every day in this giant plant of the Lock Joint Pipe Company of Mexico near Santa Clara, Mexico. Much of the pipe going into Mexico's ever expanding network of fresh water supply lines is made at this plant, the largest of its kind in Latin America.

To provide the high quality aggregate that is so important to the manufacture of durable, long lasting concrete pipe, KENNEDY equipment was selected. Experienced KENNEDY engineers designed the entire aggregate facility, and KENNEDY Gyratory Crushers, Conveyors and Screens were installed.

Rock processors all over the world have grown to respect the name KENNEDY, and to depend on the experience and ability of KENNEDY engineers to design complete plants which produce consistently fine product at low overall cost.

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KENNEDY Gyratory Crushers are at the heart of the aggregate plant, converting tons of rock into useful raw materials in a narrow range of sizes. The qualities which distinguish KENNEDY equipment are high capacity, quality product, low operating cost and minimum maintenance.

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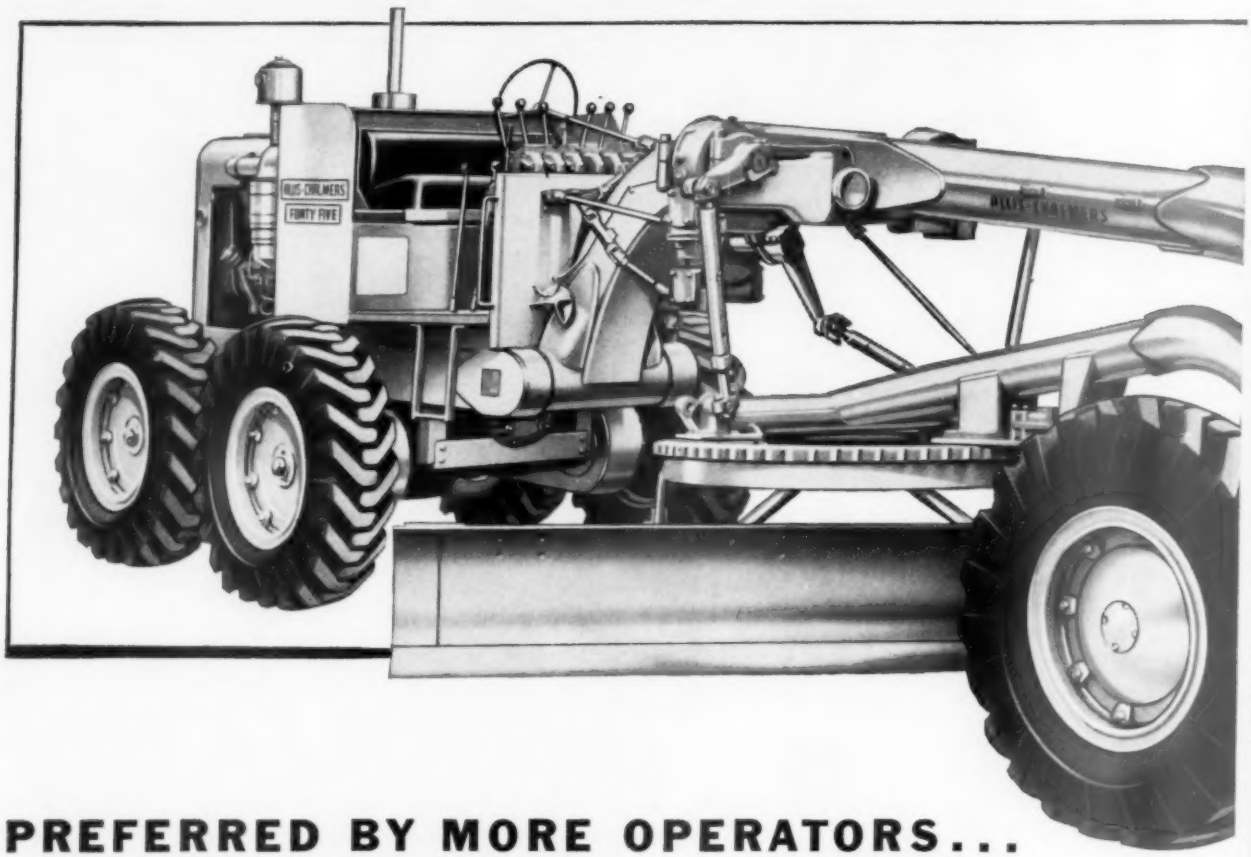

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The FORTY FIVE has the power, weight, traction and speeds you need for high-production grading. Superior stability and precision control give you deep precision cuts or smooth finishes. The FORTY FIVE is built to take the shocks and strains of heavy-duty service — and to keep production steady. Allis-Chalmers, Construction Machinery Division, Milwaukee 1, Wisconsin.

Look ahead... *move ahead* ...and stay ahead with **ALLIS-CHALMERS**

Allis-Chalmers FORTY FIVE performance

- 120 brake hp
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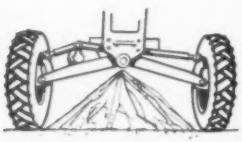
- 3 reverse speeds to 7.0 mph
- 23,800 lb approx.

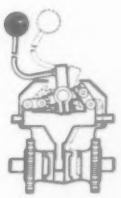
Advantages that mean more production . . . less maintenance . . . easier and better operation



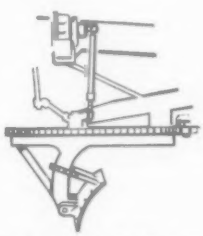
Extra high axle and throat clearance means bigger loads at the blade.

The ROLL-AWAY moldboard rolls dirt, gives more performance per horsepower, more production per gallon.

Fully enclosed power steering — easy control under all conditions.



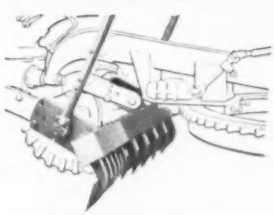
Toggle-type controls are exclusive with Allis-Chalmers.



Front-mounted lift cases eliminate long shafts that twist under loads.

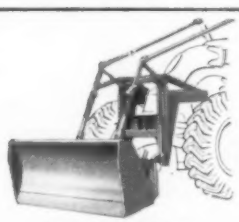
Matched attachments and accessories make it a year-round producer

All-steel, stand-up cab

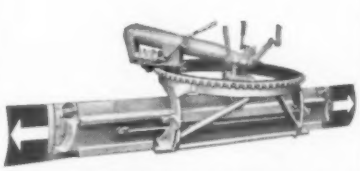


11-tooth, V-type scarifier

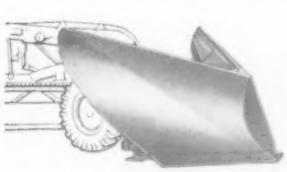
Hancock elevator



8-foot bulldozer



Hydraulic, shiftable moldboard



V-type snowplow

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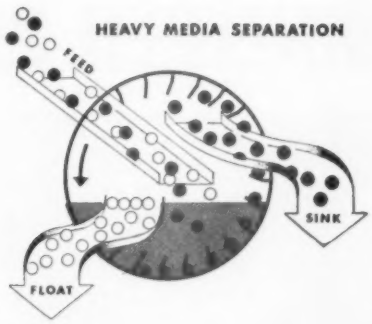
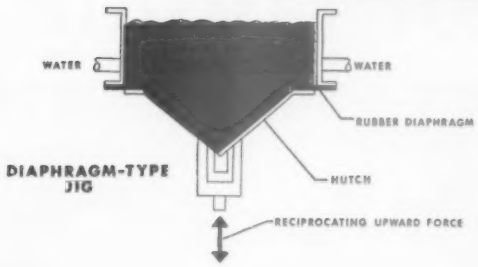
Trend 4





Upgrading marginal deposits

BECAUSE SPECIFICATIONS for concrete aggregates are getting stiffer, producers in areas where good rock is scarce have been turning to one of four processes for upgrading marginal material.

One is called **heavy media separation,** and uses a heavy liquid medium to float away unwanted light materials. A spot where HMS really does a job is in working the deposits of Killins Gravel Co., Ann Arbor, Mich. Its glacial gravel deposits contain over 10 percent of undesirable chert, shale and sandstone. Killins finds that its HMS-processed gravel has less than two percent of these deleterious materials. And further, the treated gravel brings a premium price—27 percent more than untreated gravel. Killins estimates that the new equipment, made by Western Machinery Co., definitely pays for itself with a nice profit besides. Thirteen plants in the U. S. now use HMS.

The **jig** finds a satisfied user in Standard Slag Co., which has four at its Massilon, Ohio, sand and gravel plant. The original three jigs were so successful in removing 8 to 15 percent of coal, shale, chert and rotten sandstone that the firm installed a fourth. Now, less than 2 percent of the soft materials remain in the gravel, which is processed at between 22 and 40 tph., depending on gravel size. The 5 x 7-ft. units, made by Meckum Engineering, Inc., each use 500 gpm. of water to aid in processing a bed of material about 6 in. deep. The up-down motion of the perforated support plate causes the lighter particles to float away from the sound gravel. There are 27 plants using jigs.

A third new development is called the **hydraulic rising-current classifier.** The process uses a current of water rising through a bed of gravel supported on a perforated inclined plate. The buoyant current lifts the lightweight deleterious material, thus separating it from the sound gravel. A visual inspection of one of two units installed indicates that it is doing a good job. Maintenance costs on the unit, which has no moving parts, are said to be very low. The two firms owning the units, made by Fuel Process Co., South Charleston, W. Va., are Ohio River Sand Co., Pomeroy, Ohio, and Tri-State Materials Co., Louisville, Ky.

The final new process for upgrading materials, an imaginative one, is called **elastic fractionation.** It takes advantage of the difference in elasticity or bounce between weak and sound stone. Gravel is dropped in an even stream onto a tilted, flat steel plate. Because the sound stone bounces farther, it can be separated from the weak. By using dividers in the hopper which receives the bouncing stone, three grades of rock are provided. The best grade is kept, the middle grade is recycled and the poorest is sent to another bounce plate where the process is repeated.

In 1957 Whittaker and Gooding Co., near Ann Arbor, Mich., became the first (and so far the only) firm to adopt the new Blaw-Knox Co. system. They report an upgraded product with low operating and maintenance costs.

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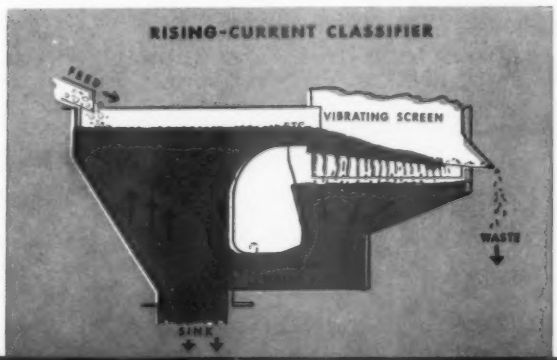

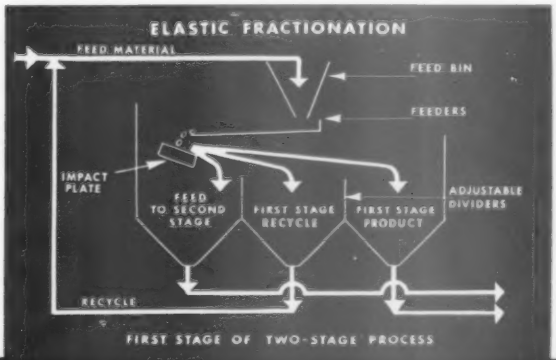

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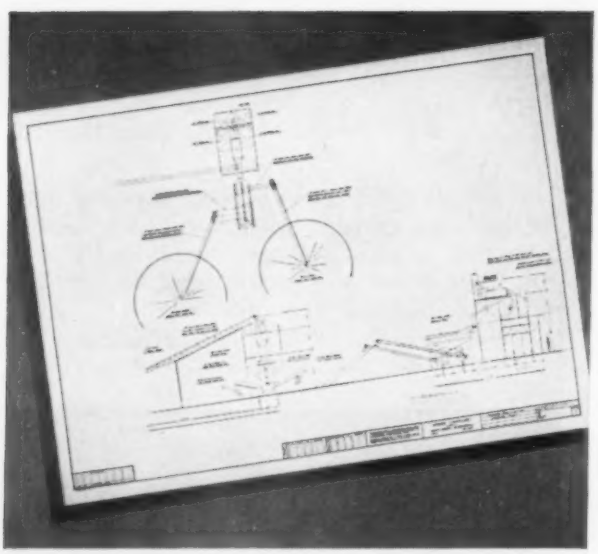


Clear, orderly, integrated plans such as these developed by the Rock Products Engineering Group result in efficient, low cost operation.

Whether you are planning a new plant or a plant addition you'll want expert engineering assistance all the way. Now, at minimum cost, the Hewitt-Robins Rock Products Engineering Group can put over sixty-five years of aggregates industry experience to work for you right from the start. Equipment selected from Hewitt-Robins standard stock units assures you of fast delivery, quick installation, low maintenance costs, with replacement parts as near as your telephone, and proved performance for many years.

. . . And the men from Hewitt-Robins are available every step of the way to help make the most economical use of your resources in building an installation geared to produce profits. Here's how:

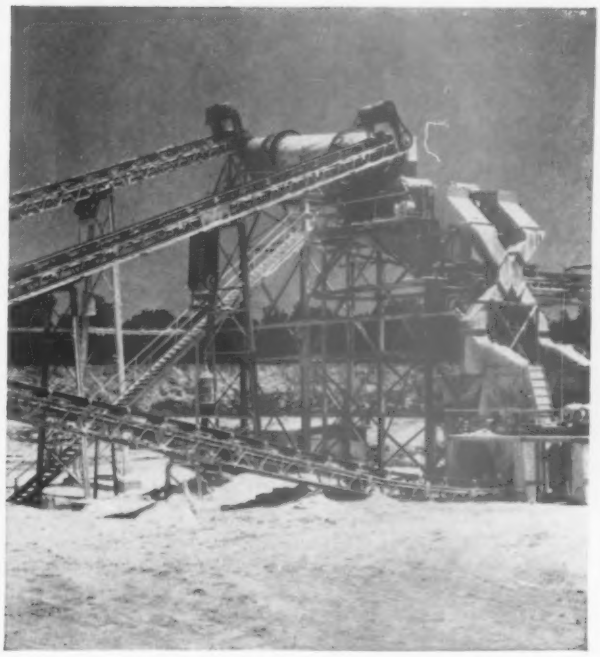
FLOW-SHEET DEVELOPMENT—A thorough analysis of your requirements from raw material to product, plus the utilization of the most efficient equipment selection, is the basis for flow-sheets tailored for maximum flexibility.

PLANT LAYOUT—The most practical use of terrain and access, modern conveying and sizing systems, and the latest developments in automation will be included on your flow-sheet.

EQUIPMENT SELECTION—The combined knowledge of *experts* on all phases of your plant (conveying machinery, screens, crushers, conveyor belts) is used in recommending the right equipment for your particular job.

FROM STANDARD STOCK UNITS

ADDITIONS . . .



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DESIGN—Hewitt-Robins, using the latest techniques in structural design, foundations, etc., engineers your plant for fast, easy erection—either by your crew or ours.

INSTALLATION—Hewitt-Robins will build the plant complete or furnish any specialized assistance you may require.

MAINTENANCE—We also offer maintenance plans which provide for regularly scheduled inspections by our maintenance experts, on-the-job training of your maintenance personnel, and well thought out spare parts programs. This is especially important because H-R manufactures conveyor belt, idlers, screen cloth, as well as replacement parts for other components . . . items that are integral parts of any maintenance program.

This kind of integrated planning is possible because of Hewitt-Robins' wide experience and technical know-how in materials handling. Each manufacturing division of Hewitt-Robins specializes and is expert in its own phase of design and manufacture. The Rock Products Engineering Group coordinates this experience and technology to provide you with better integrated plant operation at minimum cost.

You'll find, too, that Hewitt-Robins' nation-wide network of strategically located warehouses brings savings to users of H-R industrial machinery products through faster fulfillment of new orders . . . faster delivery of replacement parts . . . fewer lost production hours when mechanical breakdowns occur.

Hewitt-Robins manufactures a rugged line of equipment for use in the rock products industry, including idlers, conveyor belt, vibrating screens, screen cloth, heavy duty scalpers, feeders, sectional conveyors, reducers, level indicators, and trippers. To find out how Hewitt-Robins products and services can help you, consult your classified telephone directory for the nearest H-R representative, or contact Hewitt-Robins, Stamford, Connecticut.

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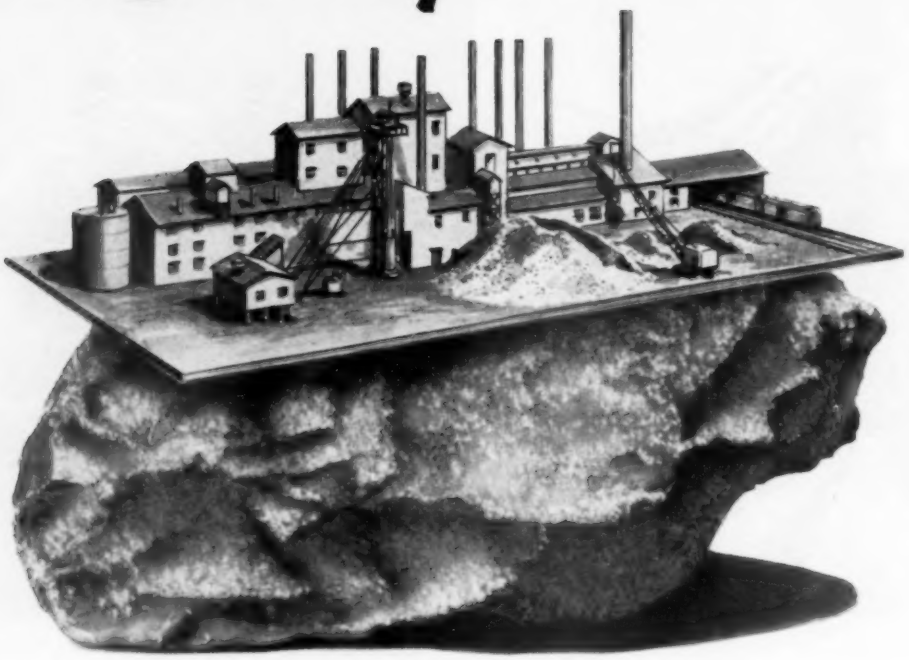

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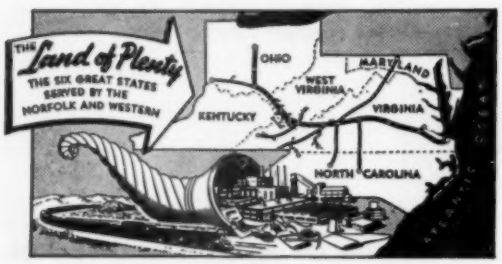

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Trend

5 Better feed control

THE MOST COMMON REASON for installing a special type of feeder is to control precisely the feed rate to a piece of equipment. But one type of feeder has another feature—it can scalp off oversize rock as well as feed a crusher. Called a **wobbler feeder,** the unit can handle a wet, mucky feed as well as dry material without clogging.

Quarve and Anderson, rock products firm in Rochester, Minn., found the perfect answer to a sticky problem caused by a wet clay mixed in with its limestone deposit. When it rained, production was cut from nearly 400 to less than 100 tph., at a time when a rush order called for 130,000 tons of rock in two months.

The answer was found in an impact crusher in combination with a wobbler feeder made by Universal Engineering Corp. Self-cleaning, the device lets the minus 2-in. clay, shale and broken stone drop through. Thus only the larger stone, largely free of clay, reaches the crusher and the clogging problem has been stopped.

A West German producer encountered trouble with his double-shaft hammermill because large blocks of hard rock occasionally jammed the hammers. Furthermore, the raw limestone contained so much clay that the crusher grates became clogged and stopped the crusher. To control the situation, one man had to devote full time watching the crusher to prevent damage.

The firm found its solution in an **automatic control system** which stops the apron feeder if the crusher jams. Not until the crusher has freed itself from the overload will the apron feeder start up again. The system works like this: an impulse transmitter in the rotor circuit of the crusher motor actuates a relay in the apron feeder motor when a crusher overload occurs. This stops the feeder motor, an ingenious trick. And the firm is saved the cost of one man's time.

Two U. S. producers have devised valuable pieces of equipment by welding heavy steel spikes to a tubular metal hub. Cooley Gravel Co., at its Littleton, Colo., plant, uses its device as a feeder. As it revolves, the 2-ft. diam. drum with 6-in. spikes drags sand and gravel directly to a vibrating screen. It eliminates the clogging problem encountered in the feeder previously used. Clay in the feed material is removed by a rotary scrubber and screw classifier, which follow the vibrating screen in the process flow.

The other producer, Straits Aggregate and Equipment Co., Millersburg, Mich., uses the spiked cylinder for a different reason—to eliminate large cobbles from the feed conveyor. Their spiked log, set at an angle to the belt, rotates against the flow and rolls the cobbles off to a pile beneath. They find use as riprap and dike armor.

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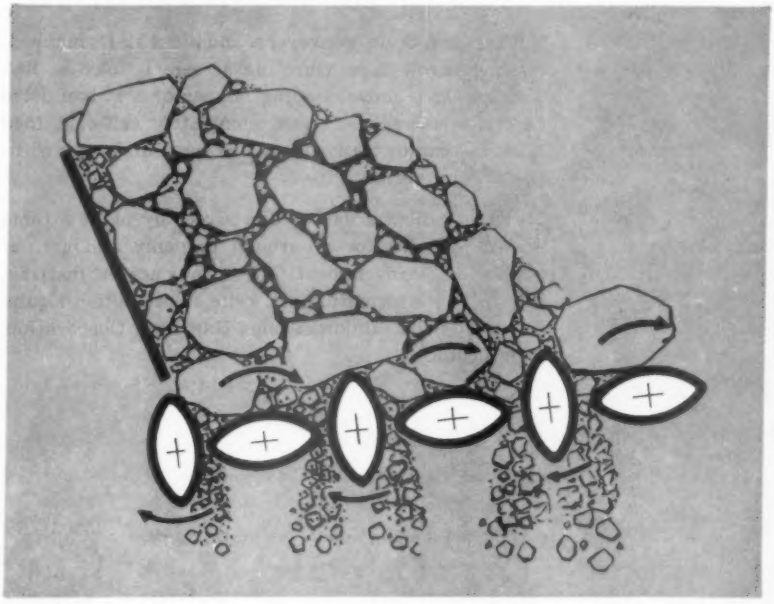
Elliptical bars feed rock, let fines fall through



Spiked log rolls cobbles off belt

Lima Austin-Western Model 101-S Plant, owned by C. W. Allen, Wilburton, Okla., producing gravel filter for Table Rock Dam on White River.

LIMA Austin-Western 101-S Plant Speeds Dam Project in Missouri

This high-capacity Model 101-S Plant is being used to produce gravel filter for the slope of Table Rock Dam, on White River, near Branson, Mo. Using riverbed gravel, the plant turns out an average of 100 cu. yds. per hr. of material ranging in size from 3 in. down to fine sand.

This portable crushing and screening plant sets a new high standard for high production and low maintenance. While intended primarily for gravel operation, it performs equally well in quarry service when combined with a portable primary. Standard equipment includes a 10 x 36-in. primary jaw crusher, a 30 x 20-in. roll crusher, 30-in. conveyors, and a 4 x 12-ft. inclined, positive-throw type vibrating screen. It may be had with either a shovel-loading hopper or a swivel drive for feed conveyor. It is a completely self-contained unit that can be transported over most highways without special permit.

Make your next crushing and screening plant a Lima Austin-Western for all-around economy and greater returns on the investment. Call on your nearest distributor for full information. Or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

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14 real cost-cutting ideas

1. New equipment or new applications for equipment are always popping up, and many are big efficiency boosters. One such new concept finding acceptance by some producers is use of **LP gas** as fuel for their trucks. While a ROCK PRODUCTS survey shows that only about two percent of the industry's trucks use the fuel, the savings to be had in fuel and maintenance costs are remarkable.

One producer reported that oil must be changed only at the 10,000-mile mark since he switched over to LP gas. Furthermore, the clean-burning gas is said to prolong engine life by as much as three times more than gasoline because it does not form carbon, lead or varnish deposits and it burns slowly with minimum damage to engine parts. Finally, the fuel is far less expensive than gasoline. It costs about 12 cents per gallon, or little more than one-third as much as gasoline according to one user.

2. Merritt-Chapman & Scott Corp., a construction firm, wanted to get an exact picture of the sand and gravel deposits to be worked in making aggregates for the Glen Canyon Dam. It hit on the idea of using a **bucket drill.** This rig was previously used only in digging foundation and septic tank holes and the like, but it can give a large enough sample for screen sizing, is much faster than a dragline for this job, and the cost is only one-fifth that of hand labor. The unit, a Calweld rig, was discussed in articles in the June and July, 1958, issues of ROCK PRODUCTS.

3. **Ripper teeth** attached to heavy dozers are being used in some aggregates plants in an attempt to speed quarry production. The idea is that the ripper can loosen some stone or gravel sufficiently for a shovel to go to work, eliminating the drilling and blasting operations. A survey made by ROCK PRODUCTS' research department showed that 18 of the 141 dozers operated by 50 respondents were equipped with ripper teeth. Where the rock or gravel is not too hard, the idea looks promising.

4. Not too many months ago several Southern California aggregates producers got together to see what **diesel-powered trucks** could do to cut their costs. Here is what they found: First, they noted that downtime is about 25 percent less with the diesels, since they do not have the ignition system used by gasoline rigs. Second, the pro-

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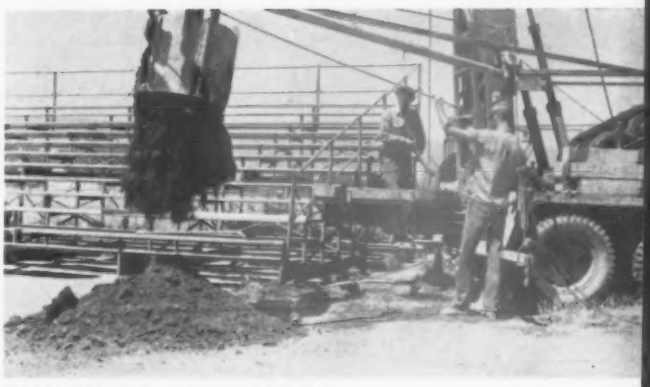
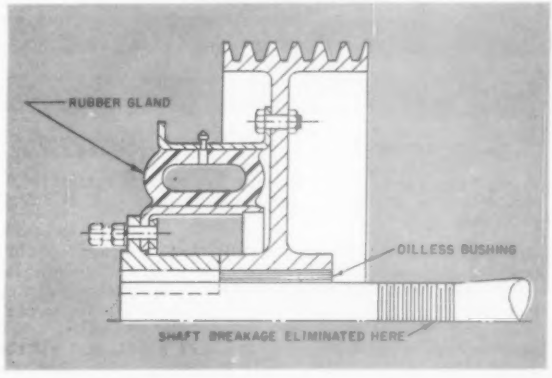


Bucket drills find use in pit exploration

Ripper on heavy dozer loosens rock in deposit

Rubber-tired tractor is finding many uses

NEW COUPLING



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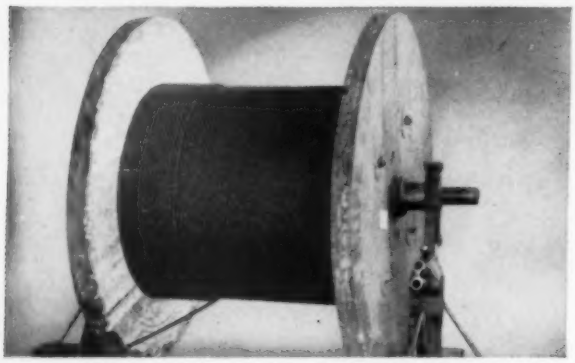
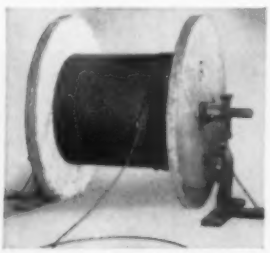
How to Get Longer Service from Wire Rope: Proper Unwinding, Socketing, Seizing, Clipping



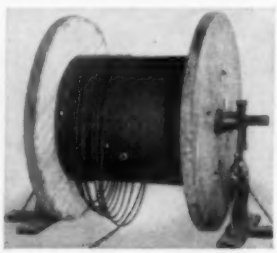
Here's the way to set up reel for unwinding

The stock reel should be set up on jacks, so the rope will come from the under side of the reel as shown in this picture.



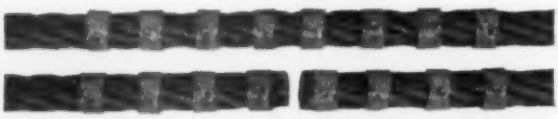
Reel set up WRONG

The rope is coming from the top of the reel and forming loops as the reel over-runs. These loops are likely to form kinks and dog-legs, which can be ruinous to rope life.



Reel set up RIGHT

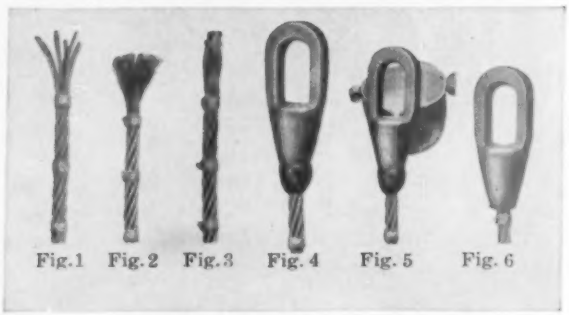
Unwinding has started, and the reel is spinning faster than the rope is being pulled off. But because it's coming from the under side of the reel, the rope is simply loosening on the reel, with no damage.



Simple way for PROPER SEIZING

Since practically all wire ropes today are preformed, we suggest that when cutting you put only one seizing on each side of the cut.

For ropes other than preformed, *three* seizings should be used on each side of the cut so there will be no misplacement or relative movement of strands. *Four* seizings on each side are required for a lang lay rope, or any rope having an independent wire rope core or a wire strand core. *Four* seizings are also needed for all 18x7 ropes, and all ropes larger than 1" diameter.



Nine Steps of Correct SOCKETING

1. Securely seize and serve with soft wire ties before cutting, and have at least two additional seizings placed at a distance from the end equal to the length of the basket of the socket.

2. When the rope is properly seized, take off the end seizing. Cut the fiber center back to the seizing, as shown in Fig. 1 above. Untwist and broom out the wires. See Fig. 2.

3. Clean the wires for the distance they are to be inserted in the socket. Use benzine, naphtha, gasoline or other solvent. Then wash off in boiling water or boiling ammonium chloride used in Step 5.

4. Then dip cleaned wires in commercial muriatic acid to a depth not greater than ¾ of the cleaned length of wire. Keep the wires immersed for 3 minutes, or until the acid has thoroughly etched each wire. Be sure acid does not contact any other portion of rope.

5. Immerse wires into boiling ammonium chloride. A white coating will be left on the wires.

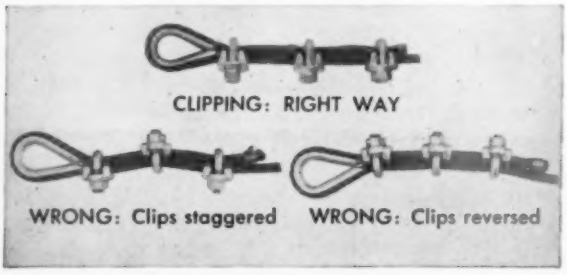
6. Place a temporary tie wire over the ends of the cleaned wire (see Fig. 3). Be careful not to get the cleaned wires greasy or oily.

7. Insert the rope end into bottom of socket. Remove temporary tie wire.

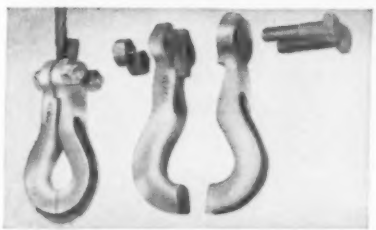
8. Holding the rope vertically in a vise, set the socket so that the wires are flush with top of the socket basket and seal the bottom with putty or clay (Fig. 4). Pour in among the wires about ½ teaspoon of sal ammoniac crystals.

9. Pour molten zinc into the basket to fill (Fig. 5). When zinc is solidified, remove seal. Socketing is complete as shown in Fig. 6.

58-3



Tips

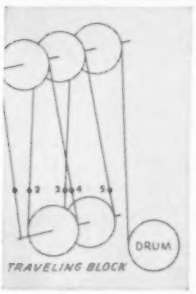


Be sure to use right FITTINGS

The fitting you use on wire rope can handicap it or enable it to work at full efficiency. Fittings which derive holding power from crimping action are harmful to the rope.

Shown here is a clamp that has no wrong side—can be put on either way. It snugly saddles the rope, grips larger surface area in such a way that loads are carried almost solely by friction rather than by crimping action. Combined in its two parts is a thimble and the parts are interlocking to prevent collapse of the thimble and to eliminate all shear on the bolts.

How to figure REEVING loads



Reeving ropes through the sheaves multiplies the number of parts supporting the load. The lead line to the drum carries the weight of the load lifted, divided by the number of parts of line supporting load, plus the accumulation of friction on all sheaves.

Here's how to count the number of parts supporting the load. Draw an imaginary line across the parts of the rope supporting the load.

The efficiency of reeving systems ranging from one to eight parts is shown in charts which Union Wire Rope engineers make available to users.

Your Tuffy distributor will help you with any wire rope problem

If you aren't acquainted with him, look under "Wire Rope" or "Slings" in the classified pages of your telephone directory. And ask him to put you on the mailing list for free "Rope Dope" educational bulletins. They're packed with boiled-down, useful information on the selection and care of wire rope for greatest service.

Extra Strength Alone Is Not Enough . . . Wire Rope Must Be BALANCED

Union Wire Rope Corporation has been making extra high strength rope for years for such uses as chokers in the logging industry, coke breakers in refineries and other purposes where it is a factor that overrides other rope characteristics.

But strength alone is not always the answer to the question of the proper rope to use. Extra high strength does not increase flexibility, resistance to crushing, abrasion or fatigue. It does not overcome the internal nicking and galling which occurs as the oil film breaks down from excessive pressures. It does not compensate for the core crushing which accompanies excessive loading. Extra high strength, in short, is not the only factor in proper design and use of wire rope.

Union Wire Rope combines such qualities as strength, flexibility and toughness in the properly balanced relationship to assure most efficient service and longest life in the operation for which the particular rope is designed. In most applications, extra high strength can add little to rope service if it throws other rope factors out of balance.

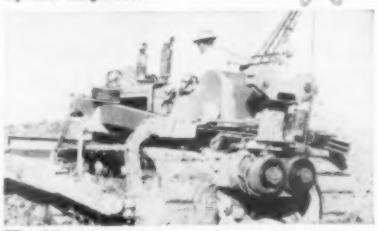
Tuffy BALANCED Special Purpose Wire Ropes

Tuffy BALANCED Slings & Hoist Lines

Top-performing team in every type of materials handling. Tuffy Slings are made of a patented, machine-braided fabric; stays extra flexible, can't be seriously hurt by knotting or kinking. Tuffy Hoist Line is a special construction of super flexibility and toughness.

Tuffy BALANCED Scraper Rope

It's flexible enough to withstand sharp bends, yet stiff enough to resist looping and kinking when slack. Moves more yardage per foot because it's specially built and balanced to take the beating of drum-crushing abuse.



Tuffy BALANCED Dozer Rope

Built to give you longer service with less downtime. 150' reels of 1/2" or 9/16" mounted on your dozers allow you to cut off worn sections without wasting good rope. Put Tuffy Dozer Rope on the job and watch costs go down!

Tuffy BALANCED Dragline Rope

Made to give you maximum abrasive resistance with super flexibility. Rides smoothly on grooves; hugs the drum when casting for full load. Consistently dependable in handling any material — wet or dry dirt, sand, gravel, rock, cement or minerals.

union Wire Rope corp.

SUBSIDIARY USS STEEL CORPORATION

2156 Manchester Ave. Kansas City 26, Mo.

Specialists in high carbon wire, wire rope, braided wire fabric, stress relieved wire and strand.

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14 cost-cutting ideas, continued

ducers report a drop in fuel costs and consumption and higher average speeds with their lightweight rigs. All in all, the Southern California producers are highly satisfied with their switch to diesel power. A complete report is given in ROCK PRODUCTS, June, 1957.

5. Here is another unit which, in certain spots, can do a better job than the traditional equipment. Because of its speed (about 20 mph.) and low tire maintenance costs compared with crawler tracks, the **rubber-tired tractor** is replacing the crawler for some jobs. It does not have the push of a crawler at speeds below 2 mph., but some quarries have found that their rubber-mounted units can replace two or three crawlers at scattered quarry and plant sites. For such jobs as cleaning up around quarry shovels and pushing scrapers, the wheeled tractor, made by LeTourneau-Westinghouse among others, is often the best bet.

6. The **scraper** is itself finding increasing use in the quarry for stripping overburden. Commonwealth Sand & Gravel Corp., Richmond, Va., found that a huge two-engine, four-wheel-drive scraper with a dozer assisting could replace several units. At one time Comonwealth used a dragline and rear-dump trucks, and in 1956 a contractor used as many as seven scrapers to do the stripping. But now the firm has discovered that just the two Euclid units and two operators do the job—at a definite saving.

7. Two couplings are designed to cushion equipment from shock loads and thus prevent costly downtime needed to repair breaks. One **flexible coupling** is being used successfully by Quality Limestone Products, Inc., of Sussex, Wis., to eliminate repeated breakage of its impact crusher drive shaft. The tire-shaped rubber gland or coupling carries the motor torque, and because of its flexible nature is able to cushion shock loads and stop breakage. The pulley to which the gland is attached rides on an oil-less bushing, thus permitting the coupling to deflect under shock load. The drawing shows a cross-section of the parts in this Falk Airflex coupling.

8. The **second new coupling** is entirely different. Its use at Statler Ready Mix Concrete Co., Kalamazoo, Mich., came about because starting stress caused the starter points on a conveyor motor to

Scrapers to remove overburden are gaining in use

Hard facing is a popular cost-cutter

burn out three times in the first year of use. The new drive eliminates point replacement costs (about $30 each time), and expensive downtime that totaled an hour or more at each breakdown.

Made by Dodge Manufacturing Corp., the drive has a charge of steel shot as the key to its operation. The shot are thrown to the outside of a doughnut-shaped housing as the motor accelerates and become wedged between the housing and an enclosed rotor. Because the rotor is connected with the motor shaft and the housing with the conveyor head pulley, the drive gives a solid connection when under load. Still, it provides for gradual acceleration of the conveyor belt when starting.

9. T. L. James, Kenner, La., purchased a new design of **clamshell bucket** and is getting up to 75 percent longer life on the wire rope which operates it. The increase is gained by a new bucket operating mechanism which eliminates bending of the

Please turn to page 122

Crushing Specification Stone?

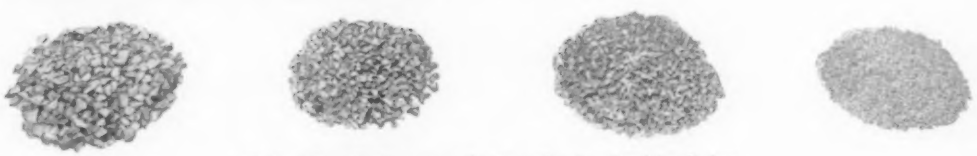
Change product size in less than a minute

SIMPLY flip the switch of the *Hydrocone* crusher to change product size. The exclusive *Hydroset* mechanism raises or lowers the crushing cone hydraulically for precise control. Crushing chamber design and choice of eccentric throws also assure uniform cubical characteristics and even distribution. Only the *Hydrocone* crusher offers the speed and convenience of "one-man, one-minute" product control in producing quality stone to meet rigid specifications.

Adjusts for wear, clears tramp iron and releases jams

To compensate for wear on the mantle and concave, you raise the mainshaft — by flipping the switch. And if your *Hydrocone* stops under load, you don't waste manhours digging out — just flip the switch again. In addition, you get protection against tramp iron and other uncrushable materials with an automatic reset in the hydraulic system.

To get all the details on the fastest and most efficient crusher operation, ask your A-C representative for Bulletin 07B7145B. Or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin.



Product from *Hydrocone* crusher is uniformly cubical in all sizes.

Hydrocone and *Hydroset* are Allis-Chalmers trademarks.

ALLIS-CHALMERS

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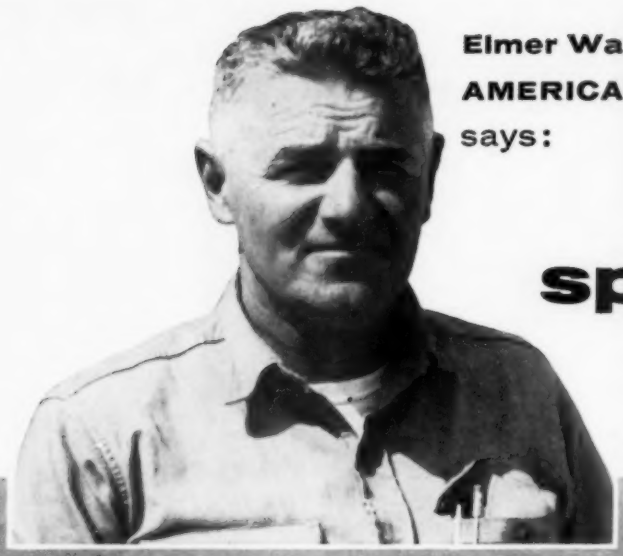
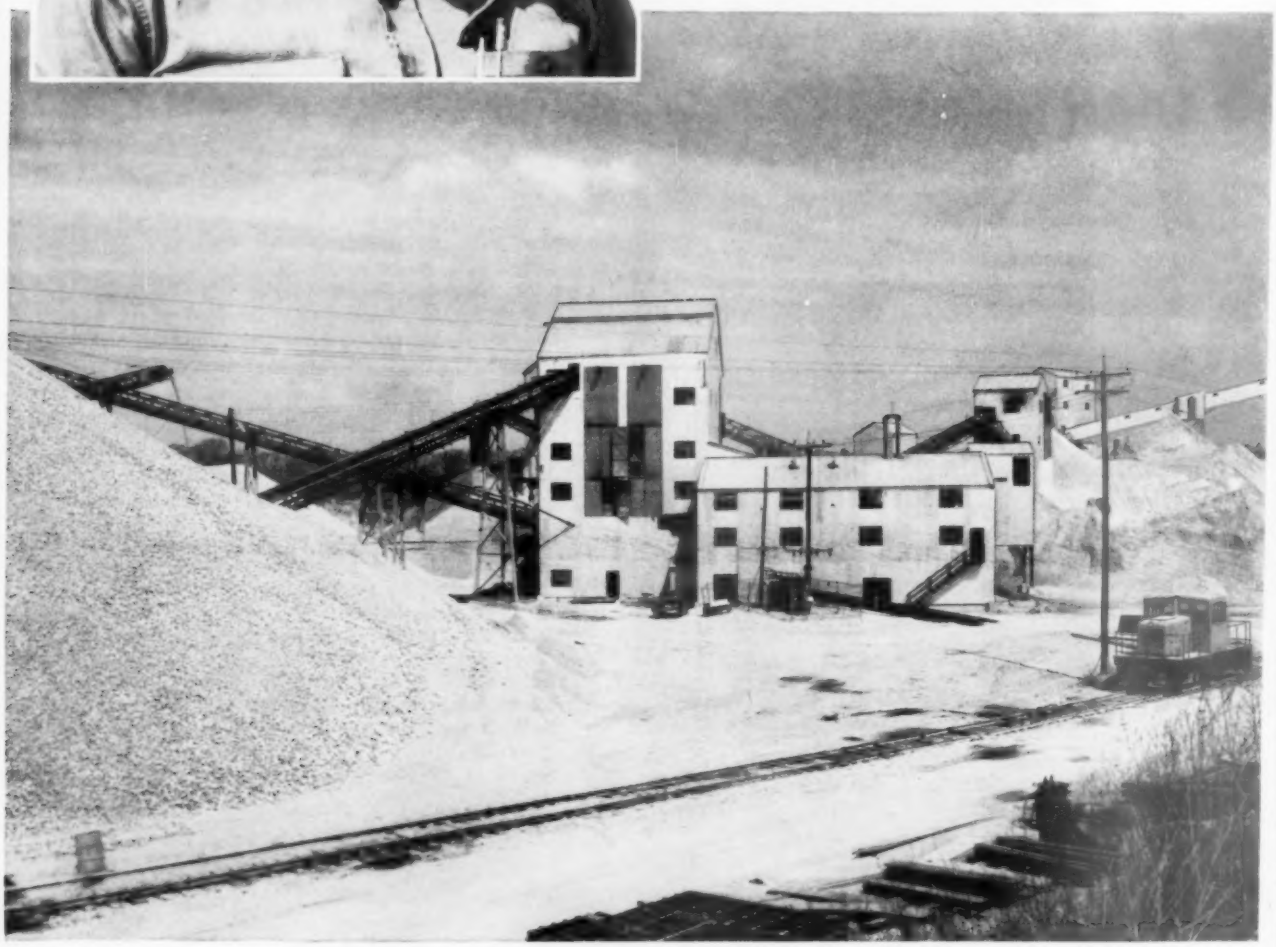


Elmer Warner, *Plant Superintendent,*
AMERICAN AGGREGATES CORPORATION,
says:

"We more specifications with



Two Jeffrey jigs, *each processing more than 200 tons of aggregate per hour, are located in this building at American Aggregates' new "pushbutton" plant at Columbus, Ohio. A third unit was recently purchased in lieu of a heavy-media separation system at one of their other plants.*

CONVEYING • PROCESSING • MINING EQUIPMENT . . . TRANSMISSION

than met rigid state for concrete aggregate Jeffrey jigs"

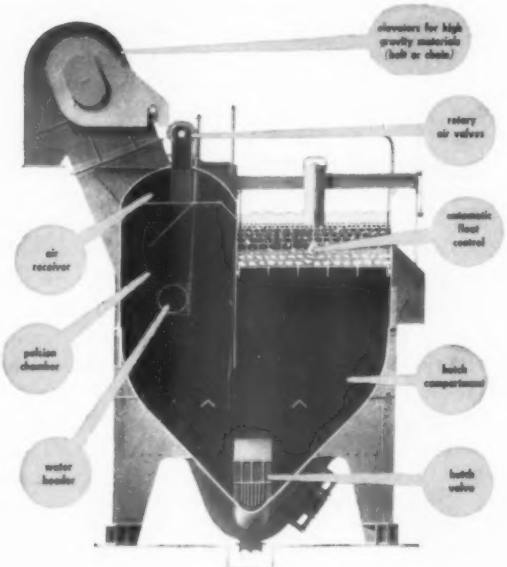
That's only part of Mr. Warner's report. "Meeting state specifications for concrete aggregate is no longer a problem with us here at our Columbus, Ohio plant. In previous operations we were hard-pressed in meeting 'specs'.

"A year ago we bought our first Jeffrey jig to help us meet state requirements allowing only a maximum of 5% deleterious material. This jig, the first to be used in this area for separation process, held deleterious material to well below the maximum allowed.

"You can see why we recently installed our second Jeffrey jig here . . . and why we bought another for our plant at Kalamazoo, Michigan."

Jeffrey jigs produce premium quality concrete aggregates for only a few pennies per ton of material processed. That's the kind of profitable performance that pays off in this industry.

Jeffrey engineers are qualified to advise you on material handling and processing equipment for sand and gravel. Get in touch with The Jeffrey Manufacturing Company, 935 North Fourth Street, Columbus 16, Ohio.



Jigging is a universal separating process — *for materials ranging from specific gravity of gold (19) to coal (1.3). It stratifies materials, separating solids in upward and downward pulsations of water. Heavy materials settle to the screen plate and are drawn off . . . lighter materials overflow. Proportions of high gravity materials may vary from 90% to 10% or less. Separation problems involving even small differences in specific gravity can be solved by efficient jigging. A Jeffrey sand-and-gravel jig handles materials as quarried. Coal, shale, clay, roots and sticks are removed . . . leaving sand and gravel of marketable grades.*

MACHINERY...CONTRACT MANUFACTURING

JEFFREY

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14 cost-cutting ideas, continued

cable as it passes through the top of the bucket and by bigger pulley wheels which put less bending stress on the wire. Finally, sheaves are designed specifically for the diameter of wire rope to be used with this Owen bucket.

10. The New England Lime Co., Adams, Mass., had trouble maintaining high output from a mill. The double leather belt transmitting power from the 100-hp. motor needed frequent adjustment to correct tension and slipping— as often as three or four times a month the belt caused downtime for maintenance. To add to the problem, the location of the shed was fairly open and subject to changing humidity, weather and dust conditions.

The firm has licked the problem with the installation of a **new drive belt** made of polymer and chrome tanned leather. "This new belt drive has caused no work stoppage due to slipping or tension adjustment since it was installed," the firm notes. It also has been found unnecessary to dress the Extremultus belt as often as previously.

New belt vulcanizing process saved firm $6,000

11. That careful quarry road maintenance is a good practice and can improve efficiency is made clear by T. C. Cooke, president of Lynn Sand and Stone Co., Swampscott, Mass. He says, "You may be able to increase your production more than 10 percent by better road maintenance." Good roads make higher speeds possible and lengthen tire life. A second-hand grader working only two hours a day can do the job in some plants, he notes.

12. Engine oil changes have always been a question mark to big motorized equipment users. They know that sometimes oil need not be changed as often as it is, but to be on the safe side they follow the engine makers' recommendations.

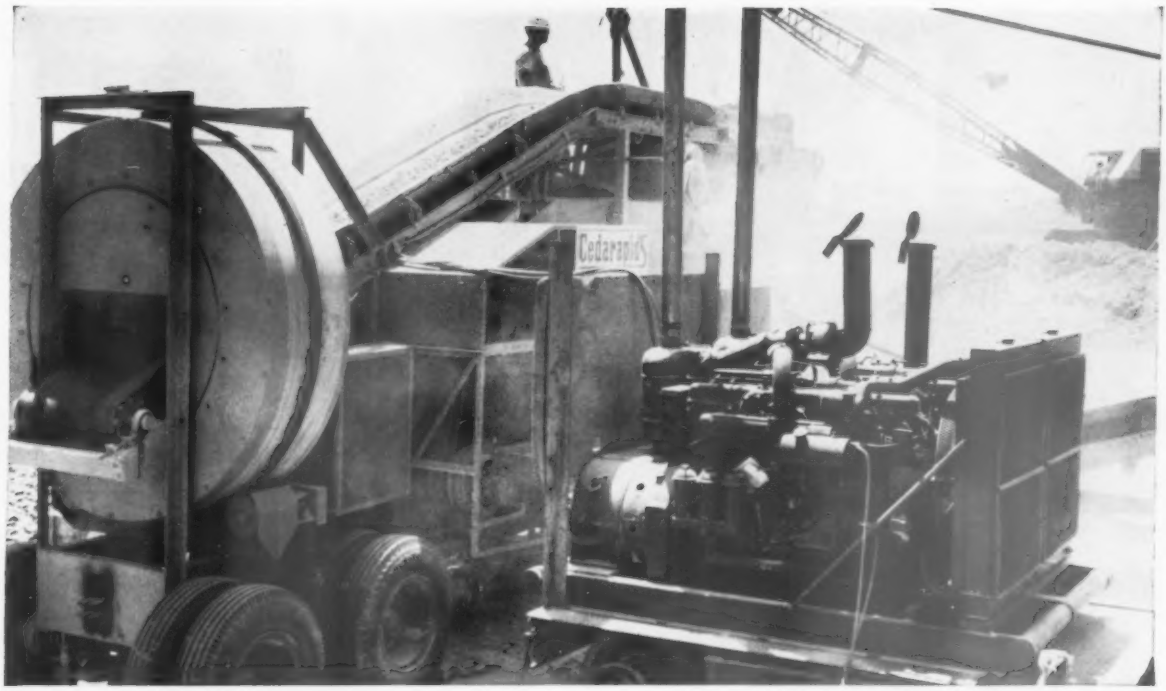
Now, however, an oil firm has come up with a quick oil-spot test which tells if the oil in the crankcase is still good. The firm quotes the records of a Kansas City freight line showing that while formerly the oil was changed at 3,000 miles, the job can be done safely at 6,000 miles without affecting engine life. The savings to be gained by using this simple Shell Oil Co. test are obvious— spending for oil and downtime can be reduced.

13. When one of Elmhurst-Chicago Stone Co.'s conveyor belts snagged the skirt of a transfer chute, the ¼-in. rubber cover was slit from end to end. Luckily, however, the firm had heard of a new chemical vulcanizing technique which might make a repair job possible. The decision to repair the 400-ft. belt proved to be a smart investment, for the repaired belt lasted for many months. By spending under $1,000 for repairs, the company avoided the expense of $7,000 for a new one.

14. Lubrication that is fully automatic can cut labor costs greatly as well as insure the advantage of regular lubrication. One firm installed an automatic lubricator on a rock crusher, and in doing so saved a man's time, cut grease consumption 56 percent and boosted bearing life from 13 months to nine years or more. Their Farval lubricator paid for itself in its first few months of use, the maker reports.

END

Graders are popular for quarry road maintenance



Cuts big crusher power costs by compounding International UDT-1091's

Contractor Charles Horn, Boulder, Colo., drives his big new Cedar-rapids crushing plant with compounded International UDT-1091 Turbotorque® power units for two reasons—price and performance.

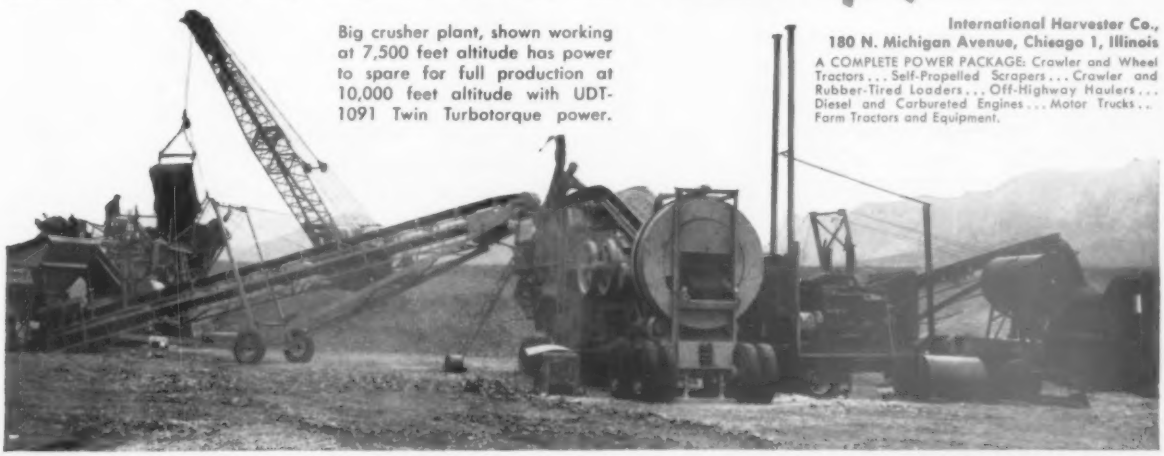
The Coloradan saved important money from the start by buying twin turbocharged UDT-1091's with Alamo compound drive for less than the cost of a single power unit with the same power output at altitudes to 10,000 feet!

And since he operates with both International crawlers and engines, contractor Horn knew in advance the UDT-1091's would give him the same dependable, low cost power.

Find out how much you can save with International power on your pit or quarry machines. Get the facts from your nearby International Power Unit Distributor or Dealer. He sells and services seven IH diesel power units ranging from 60 to 250 int. load hp as single units or up to 500 hp when compounded.

International® Construction Equipment

Big crusher plant, shown working at 7,500 feet altitude has power to spare for full production at 10,000 feet altitude with UDT-1091 Twin Turbotorque power.



International Harvester Co.,
180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE: Crawler and Wheel Tractors . . . Self-Propelled Scrapers . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Haulers . . . Diesel and Carbureted Engines . . . Motor Trucks . . . Farm Tractors and Equipment.

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NEW 1½ yd.

Move up to the Manitowoc 2300

Convertible to:

35 Ton Crane

Has low center of gravity and solid stability. Precise, positive control . . . booms to 130'.

1½-Yd. Hoe

Cuts an 11' level bottom as deep as 32' without machine travel. Has air controls and power brakes.

Big Capacity Dragline and Clam

Long reach dragline has 1½ - 2½ yd. capacity. Big output clam features fastest closing-hoisting speed.

HERE is a new, heavy, rugged shovel ready to give you *true* 1½ yd. capacity on any job you can name . . . with many profit-making features you would expect to find only on the largest units. The Model 2300 delivers smooth, powerful, steady performance in dirt or rock . . . as a big capacity shovel, a fast swinging dragline, or heavy-lifting crane.

For economical operation with little downtime; for long machine life with high trade-in value; and for full capacity and big output, the Model 2300 is a real all-around rig . . . the ideal "key" machine for your equipment fleet.

You can make more money on today's jobs only if you have "today's" equipment . . . and the Manitowoc Model 2300 is as modern as tomorrow, now and for years to come! Ask your Manitowoc distributor now for literature and full specifications!

SHOVEL!

with *MANY FEATURES* found only on the largest machines

- Simple, "Power-flo" Slide Pinion Drive ... Only 11 Gears in Entire Upper Works
- Faster Cycle Speeds
- New, Easy Hydraulic — Jack Adjustment for Proper Crawler Tensions
- Air cooled, Disc-Type Swing Clutch
- Huge, 62" Ring Gear ... Big 7½" King Pin — Largest in Its Class
- Simplified Air Controls ... Smooth Torque Converter
- Modern, Centralized Lubrication

There are dozens of other important features that give you a long-life, big output machine. In the rugged lower works you'll find a mighty, one-piece carbody; long, wide-span crawlers with fully enclosed pads; fast, easy crawler tread adjustment; a heavy duty tread guide patterned after big machine design for perfect tread alignment; and a flat design roller path to provide precise load distribution.

The simply designed main machinery assures fastest cycle speeds ... directs power straight to the job at hand. Anti-friction bearings are used in all high speed parts; air cooling of the swing clutch assembly makes for uniform, constant friction — better performance; a tough, precise swing lock provides positive meshing of the swing lock on the swing gear for absolute safety. In the heavy duty drum shaft and main drive, splines are used instead of keyways so that strain is spread over a wide area; the solid rotating bed combines a heavy, manganese alloy steel casting and structurals for a solid base; and for the power to suit your job, either direct drive or torque converter are available.

Manitowoc

MANITOWOC ENGINEERING CORP.
(A subsidiary of The Manitowoc Company, Inc.)
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CRANES	SHOVELS	DRAGLINES	TRENCH HOES
20 TON - 100 TON	1-YD. - 5½-YD.	1-YD. - 6-YD.	1-YD. - 2½-YD.

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Lone Star's Hudson plant dramatized PCA summer safety campaign with this poster showing 15 accident-free days in June

Planning a safety campaign?

...take a hint from PCA's methods

By KATHLEEN KEARNEY

THE SAME TECHNIQUES that influence a worker's choice of toothpaste can be used to sell him safety. "Safety starts with technology," says Ivan F. LeGore, the Portland Cement Association's experienced safety director, "but it ends with influencing human behavior. A safety campaign must be like any sales campaign."

The PCA has been "selling" safety since 1916, when the organization was formed. In the association's Chicago headquarters, a Bureau of Accident Prevention collects, analyzes and sends out accident data for over 160 cement plants employing more than 40,000 workers, but Mr. LeGore quickly points out that he can't stop one accident from his office.

"We in Chicago supply information, leadership and guidance," he says. "From materials we provide, each plant team develops and improves its own safety program, tailored to its own needs. The actual business of preventing accidents takes place at the operating level in the plant, right where the hazards are."

An accident is caused by either an unsafe condition or an unsafe act. "Basically, both the cause and control of accidents involve the human element," says Mr. LeGore. "Unsafe mechanical conditions are permitted by people. Unsafe personal actions are committed by people. Control of both is a function of people."

The PCA's 1958 summer campaign shows how safety is sold to the people who count—the men on the job. June used to be the peak month for injuries in the cement industry. Then the association launched its June No-Accident Campaign, making that month the focus of an all-out effort

Please turn to page 128

BRADLEY HERCULES MILLS

HOW TO INCREASE CEMENT PRODUCTION UP TO 50% . . .

The capacity of an existing tube or compartment mill can be increased up to 50% or even higher simply by installing a Bradley Hercules Mill as a preliminary pulverizer on either the dry raw or finish side. Yet this increased production of cement raw material or finished cement is obtained at no increase in horsepower consumption per ton or barrel produced. The Hercules automatic electrical feed control eliminates manual operation. Rugged construction . . . dustless operation . . . easy accessibility to grinding parts keep maintenance costs at an absolute minimum. That's why so many in the cement industry rely on the Hercules Mill for increased production of finished material.

See Chemical Engineering Catalog or for complete information, write for Catalog No. 63

BRADLEY PULVERIZER CO. LONDON ALLENTOWN, PA. BOSTON

superior grinding equipment since 1891

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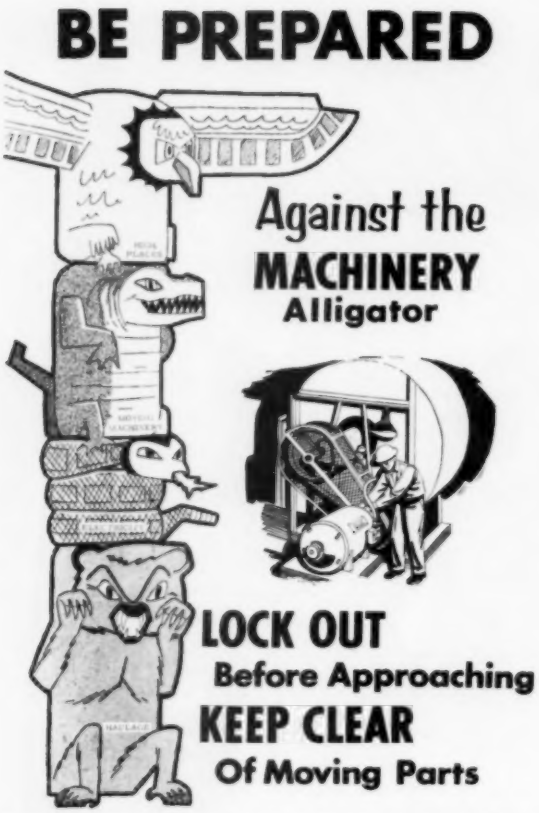

Totem pole represents four greatest dangers in cement plants: high places, moving machinery, electricity and haulage

Planning a safety campaign?

continued from page 126

to prevent accidents. As a result of this drive, held annually since 1925, June is now one of the safest months of the year.

The promotion of safety takes lots of planning. The PCA's 1958 campaign really got underway in September, 1957, when the Accident Prevention Committee, composed of 39 executives of member companies, met to choose a theme. The Accident Prevention Bureau was ready with a suggestion: Why not tie in this summer's drive with the Safety Good Turn of the Boy Scouts of America?

This idea was accepted enthusiastically. By associating itself with the year-long Scout campaign, the PCA drive would gain tremendously in impact.

According to the PCA, promotion ideas are to the safety man what advertising is to the sales manager. The objective is to get the safety message across in a way that will make the prevention of accidents interesting and important.

Roadside signs plugged safety at Lone Star Cement Corp.'s plant in Demopolis, Ala.

The bureau tries to gear the appeal of each summer safety campaign to an outside interest of employes. For example, the 1956 drive featured an election campaign, with Mr. Safety opposing Old Man Accident. Slogan that year was "Safety's My Choice for '56." Last year the bureau used a "Dragnet" theme. Member plants posted "Wanted" notices calling for clues leading to the arrest of Old Man Accident, "plant enemy No. 1."

This year the slogan was "Follow Directions for Safety in '58." This was tied in with the Boy Scout theme by a compass insignia on buttons and calendar cards and by souvenir compasses given out at regional safety conferences. The well-known Four Horsemen—the greatest hazards in the cement industry—were symbolized by a totem pole. Moving machinery was represented by an alligator, high places by a vulture, electricity by a snake and haulage by a bear.

Material started going out to member plants at the end of March. Posters and letters sent out during the 10-week preparatory period emphasized the safety parallels of Boy Scout mottoes like "Be Prepared" and "Do a Good Turn Daily." A pocket-sized folder of safety reminders, issued to all employes, listed the requirements for the Scout safety merit badge with the question, "Could you pass this test?"

The ingenuity shown by the plants in implementing the ideas developed by the association demonstrates that safety doesn't have to be a grim business. Skits, posters, displays and meetings carry out each summer's theme. Dinner meetings and contests with prizes of cash and safety equipment are held to inform employes and stimulate their interest.

Although June marks the climax of PCA's accident-prevention efforts, this does not mean that safety is seasonal. Regional conferences are held from January to April, and the PCA encourages member plants to re-emphasize safety during the Thanksgiving and Christmas holidays. The Chicago office turns out an uninterrupted flow of pertinent letters and posters, and the basic work of

Please turn to page 154

B.F.Goodrich

B.F.Goodrich Rock Logger tires can be retreaded 3 times, ready-mix company reports

GRAYSTONE of Olympia, Washington specializes in ready-mix concrete. Trucks travel on and off-the-road in stop-and-go service, rolling over such tire-killers as rocks and steel scraps at construction sites. Yet Graystone finds its tires often can be *retreaded 3 times* with practically new tire service from each retread. Why? Graystone uses B.F.Goodrich Rock Logger tires!

Graystone Dispatcher George Meyer says, "B.F.Goodrich Rock Logger tires give the kind of traction we need in rough weather." Husky Rock Logger cleats dig in to give you maximum pulling power in forward or reverse. "They give rugged dependability around rough construction work," he adds.

B.F.Goodrich Rock Logger tires are available with FLEX-RITE NYLON cord construction. FLEX-RITE NYLON withstands double the impact of ordinary cord materials, resists heat blowouts and flex breaks. Result: This B.F.Goodrich cord body outwears even the extra-thick Rock Logger tread, can often be retreaded again and again!

Your nearby B.F.Goodrich dealer is listed under Tires in the Yellow Pages of your phone book. See him today, and start enjoying the extra savings B.F.Goodrich tires give. *B.F.Goodrich Tire Co., A Division of The B.F.Goodrich Co., Akron 18, Ohio.*

Specify B.F.Goodrich Tubeless or tube-type tires when ordering new equipment

B.F.Goodrich *truck tires*

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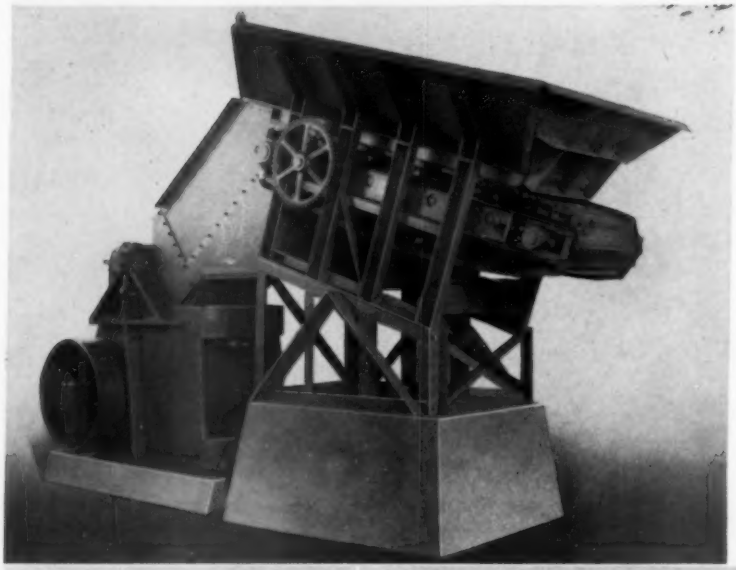
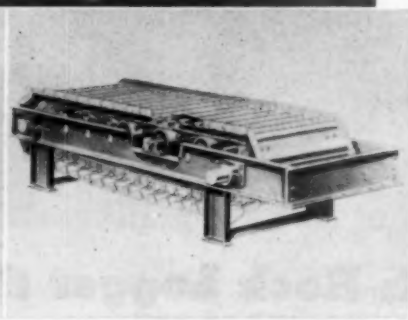
KUE-KEN® high output plants for lowest cost-per-ton crushing

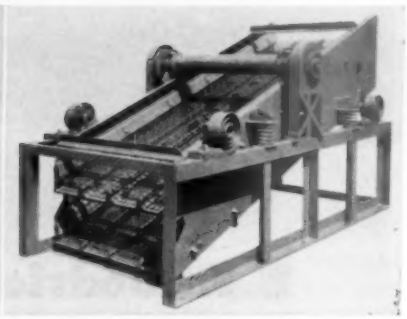


KUE-KEN 36" x 24" CRUSHER with 36" x 9' apron feeder and stationary bar type by-pass grizzley. Kue-Ken crushers in sizes from 12" x 5" to 48" x 42" as single units or in combination as shown in example (left). "Crushing without rubbing" lengthens jaw plate life 5 times or more. Built-in lubrication system avoids costly down-time. Automatic flywheel release prevents damage from tramp iron. Kue-Ken gives greater capacity for its size than any other crusher.

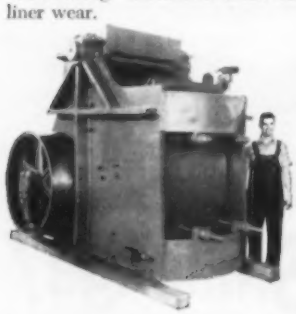
KUE-KEN GYRATORY CRUSHER fits into flow sheet where head room is limited and makes economical gyratory crushing practical in most any operation. Takes choke feed. "Crushing without rubbing" eliminates main cause of liner wear.



HEAVY DUTY APRON FEEDER. Heavy steel pans with upturned sides attached to heavy duty chain and supported on large diameter wide face rollers. Available as shown for mounting under bins or as a complete unit with hopper and gear motor drive—24" to 42" widths and various lengths.



OVERSTROM vibrating screens. Heavy duty in single, double, triple deck models up to 5' x 16'.



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Compact stone plant features—

screening, crushing, washing in one tower

By WALTER B. LENHART

RESIDENTS OF FLORIDA traditionally bask in the sun while the rest of the country shivers, and in 1957 the sky above Florida's rock processing industry was a bright blue, too.

Last year saw plenty of expansion in the industry. One new company, Rockdale Stone, Inc., of Coral Gables, is prepared for continued "warm weather" with a modern plant that combines the screening, washing and sand preparation operations in one multi-story tower. This new plant started processing in January, 1958.

Built by the company staff, the plant is located 15 miles south of Miami, near Rockdale, Fla. The plant is on the rails of the Florida East Coast Railroad and close to the Dixie Highway, which connects Miami and Key West. While the company is new, its officers are well known.

Masons sand, concrete sand and three sizes of crushed coral rock are produced. The plant is steel and concrete throughout, and capacity is 250 tph.

Stripping, underwater quarrying and primary pit loading are under contract to 3-Bays Improvement Co. of Miami. Strippings are used for fill and other purposes. Top material is first loosened by sub-soilers attached to tractors. Pushers are used to help load the carry-alls that remove the strippings to a spur beside the plant, where the limerock is loaded into gondolas by draglines and clamshell rigs. A belt conveyor system may be installed later to handle this material.

When stripping has extended to about a foot above the water table, much harder rock is reached. This is coral, an excellent aggregate for

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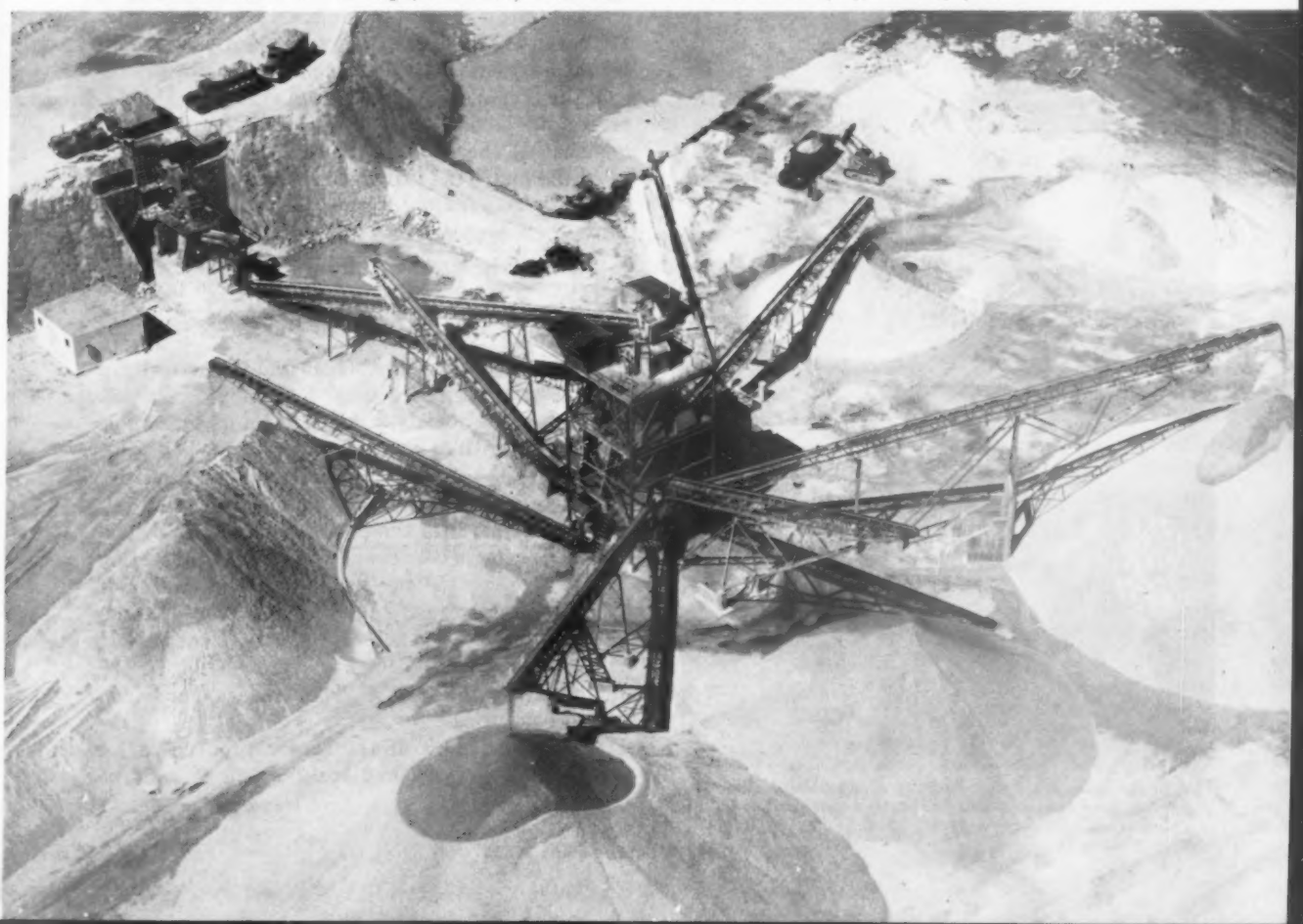
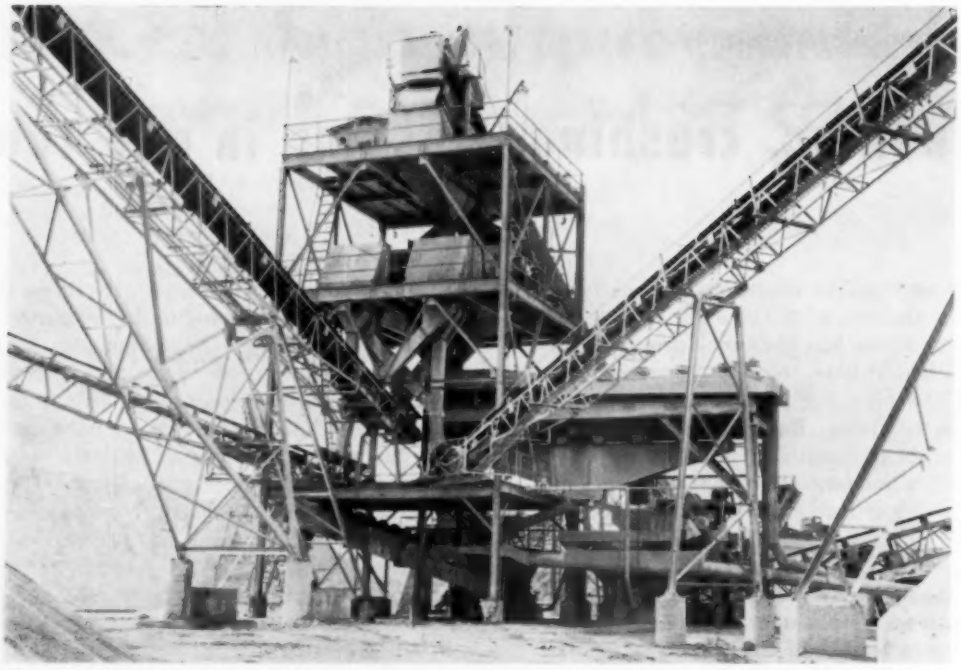
Like an octopus, the conveyors of this new, modern plant spread out in all directions from the single, multi-story tower that holds not only the crushing, screening and washing operations but also the sand preparation equipment





Close up of the tower gives a little better look at the screens on the second floor and sand washing, right

Compact stone plant

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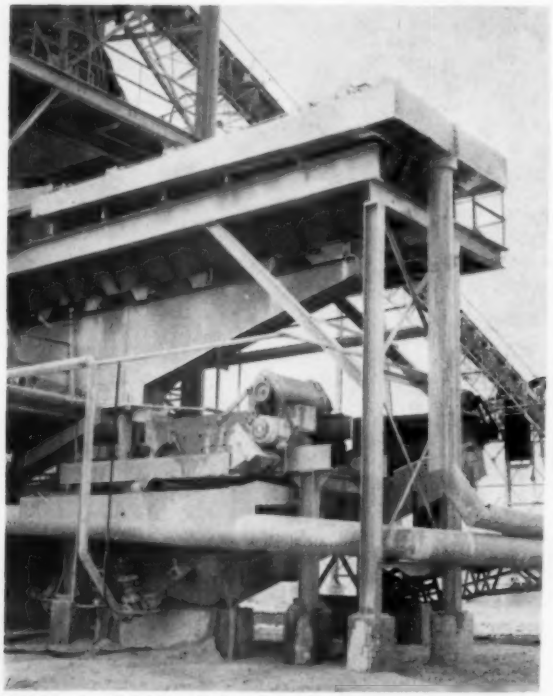

This single-deck, 3 x 8-ft. vibrating screen points up the extreme care used to keep tramp oversize out of masons sand

both concrete and black-top work. This white rock is typical of the south Florida fields, and to be recovered it must be drilled and blasted.

A rotary drill is used for primary drilling. Holes are bored to 38 ft. depths, nearly all of them under water. Excavated material is piled in windrows beside the ponds excavated by the draglines. Another dragline is used for loading the side-dump wagons that do the primary hauling.

At the plant, the primary crusher is an impactor fed by a 16-bar, 36-in. wide wobbler-feeder. The impactor is powered by a 150 hp. and a 125-hp. motor, and the feeder is equipped with a variable speed control. A short belt delivers the products of both units to a small surge bin close to the primary crusher.

This combination of wobbler and impactor has a very high capacity; a truck-load of pit run goes through the assembly too fast for a belt conveyor of normal width to handle. A short, wide belt takes the rock to the surge bin which has a reciprocating feeder to even out the feed to the plant. This arrangement permits the use of a narrower belt on the long inclined conveyor to the screening section.

The primary scalper is a two-decked, 5 x 14-ft. vibrating screen with spray nozzles. Oversize from the top deck of the screen falls to the secondary crusher, a 3240 impactor powered by a 125-hp. motor. Through material from the crusher is conveyed back to the screen.

The second deck of the screen produces a 1 x 3/16-in. size of crushed rock, which is split be-

Please turn to page 150

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A hand-operated quarry employing an extravagant amount of labor by U.S. standards. Here, quality stone is interlaced with poor stone

Lime production primitive in Africa

At one plant, 600 men turn out 200 tons of lime per day

*By VICTOR J. AZBE**

IT IS IMPOSSIBLE TO WRITE about lime or anything else in the Union of South Africa without touching on the prevailing racial dissent there. It is all-pervading, affecting personnel relations, industrial operations and all costs. It is a state about which there is no general agreement and to which there does not seem any truly satisfactory solution.

The Union of South Africa is a beautiful and bountiful country. It is heavily industrialized, civilized and wealthy, but it is a country with no racial harmony whatsoever, functioning in a state of precarious balance.

A technical writer should not concern himself with political and racial problems, but in this case it is essential. Otherwise, what could explain one of the better plants, where more than 600 men are necessary to produce 200 tons of lime per day; and why an inefficient operation is near to being justified, even though this amount of lime could be produced with one-twentieth the men? Labor in South Africa is extremely cheap. However, they are so prodigal with it that its real cheapness is questionable. Lime is cheaper than cement, as it should be, but is not in many parts of the world.

Of the rapidly increasing 220 million population of the African continent, only about 5 million are of unmixed European extraction. Two and a half million of these are in the Union of South Africa: one million English and one and a half million Afrikanders, descendants of the original Dutch settlers. In the Union also are 9 million Africans, natives of Negro races, about 1¼ million colored (mulattoes) and ½ million Asians and Indians, many of high intellect and well educated.

Please turn to page 136

**See Rock Products, February, 1958, page 110 and July, 1958, page 94 for the first two parts of Mr. Azbe's series on lime around the world*

"Bemis STEPPED-END Multiwalls perform a service for our customers . . . and so for us . . ."

SAYS E. E. STORMER, OF MARQUETTE CEMENT MFG. CO.

"The same benefits we encountered by using Bemis STEPPED-END Pasted Valve Multiwalls in our plant operation turned out to be benefits to our customers, too"... says Mr. Stormer, purchasing agent for Marquette Cement. "We like Bemis STEPPED-END Bags because they pack better and stay cleaner. Naturally, our customers are also in favor of cement bags that don't sift and get dusty. Cars stay cleaner and the bags are easier to handle."

Although Marquette officials now consider the use of these bags *primarily* as a service to customers, they still look upon them as a major improvement in their packing operation, as well. Bemis STEPPED-END bags pack better because of the Diamond O construction, stepped corners and the hand insert.

GOT ANY OF THESE PROBLEMS IN *YOUR* PLANT?

- Valve openings stuck closed . . . causing lower production and loss of bags
- Slowed production (up to 25%) due to certain types of valve inserts catching on packing spouts
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- Dusty packages on account of leakage from ends and valve opening
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Got any of those problems?
Sure you have . . . maybe all of 'em.

YOU CAN ELIMINATE ALL 6 BY USING *BEMIS STEPPED-END MULTIWALLS.*

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Fourteen men charging a kiln amid dense, acrid, tarry smoke. All seven cars are charged at exact time to avoid segregation of stone sizes and admixed coal

Lime production in Africa

continued from page 134

The difference between the Afrikanders and the British is that the former are enamored of the country; it was theirs, they fought for it, lost it but politically rewon it. To the British also it is a lovely country, but primarily it is part of an empire centered in Trafalgar Square. To the Afrikanders, it is home. I can readily imagine the Englishman moving to other parts of the world, and many want to, but not so with the Afrikander. If he were to move, he would be so misplaced that he would virtually wither away.

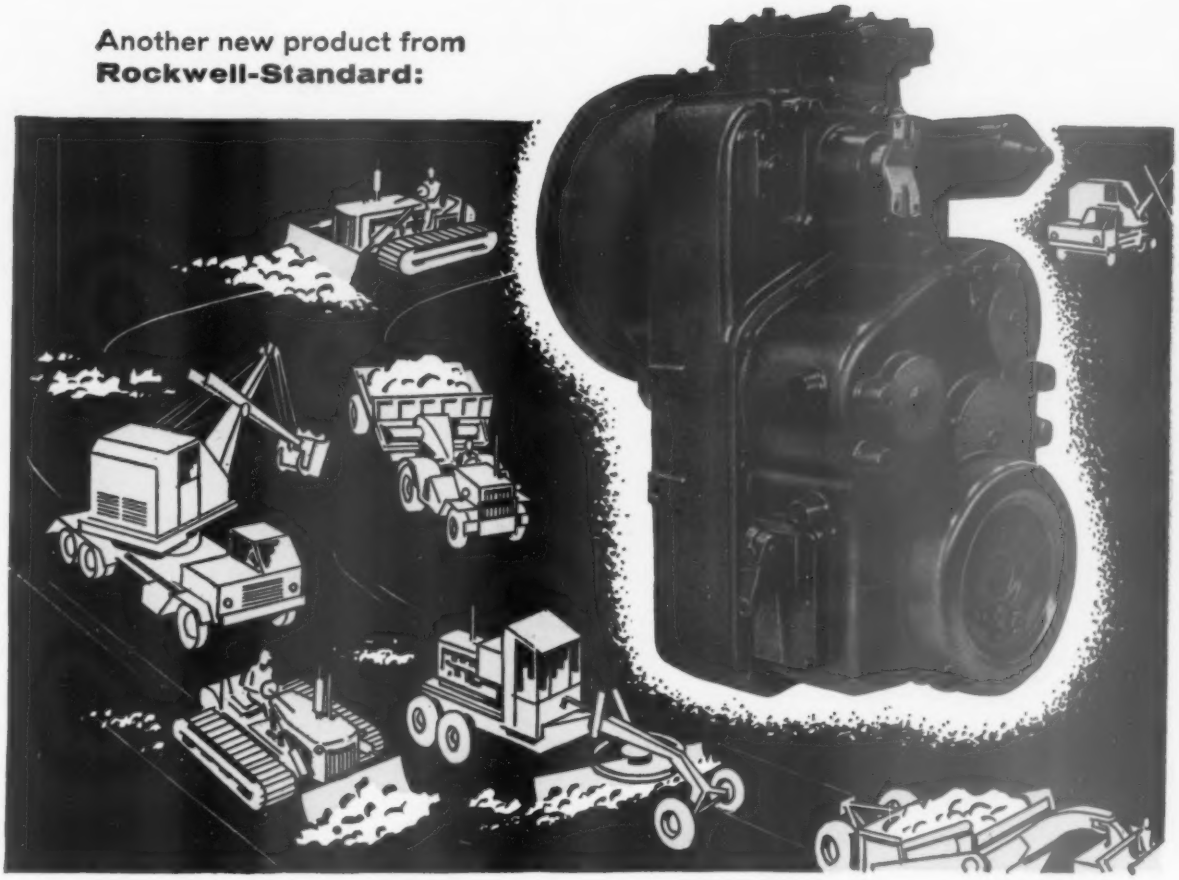
We landed in Johannesburg in the very early morning. The immigration officer was cross and suspicious of my perfectly in order passport, while the customs officer, who was justified in being suspicious considering what I was lugging, was delightfully pleasant. One wrote in English on one side of my entry permit, the other in Afrikaans (the Dutch dialect spoken in South Africa) on the reverse side. There are two official languages, in jealous equality. All street signs appear in this manner and all official papers, such as the South African Standard Specifications for lime.

Three South African lime producers offer "high-calcium" lime. But according to our concept, stone containing eight percent or more of magnesia as theirs does is not high-calcium stone. Other plants produce a dolomitic lime, with 15 companies producing about 350 tons of lime a day. They operated in combination, with production and lime distribution apportioned by a central association. The kilns of these dolomitic plants were vertical, bottle-shaped shafts which operate on continuous natural draft. Most were about 30 ft. high and 12 ft. in diameter at the widest point.

South African fuel is coal and it is probably cheaper here than anywhere else in the world, about $1 per ton at the pit. But, of course, there is an additional freight charge. Coal was high in ash and volatiles, about 10,000 Btu. per lb. as received. Charging was in the ratio of two of stone to one of coal, with kilns drawn twice a day, at 11 a.m. and 4 p.m. and none during the night. Lime to fuel ratio was 2:2 and 1½:1, which is very poor, considering that the stone is dolomitic. However, all volatiles are lost, distilling off in the preheating zone. It is not conceivable that any reach the calcining zone, nor even the magnesia dissociating zone. At least 30 percent of the heat value of the

Please turn to page 138

Another new product from
Rockwell-Standard:



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Simple to operate, too, a flip of the operator's lever accomplishes power shifts within each range and without any interruption of the power flow. Automatic features of the converter and ease of power shifting simplifies operator training and lengthens vehicle life.

With four speeds forward and reverse, the Hydra-Drives Power Shift Transmission is ideally suited for vehicles which must travel in both directions during a normal work cycle. Rated at 550 ft. lbs. input torque, they can be used with a wide range of internal combustion engines up to 250 H. P.

The Transmission and Axle Division of Rockwell-Standard specializes in drive components only, and *does not compete with manufacturers of end products.* Take advantage of 50 years' experience in the manufacturing of power transmission components, specify Rockwell-Standard.

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Stone car cable drag to kiln plant. A good system if track is kept in order and coupling and uncoupling systematized

Lime production in Africa

continued from page 136

coal must be wasted. The kilns act as coke ovens, and the lime calcines with heat from the coke as in all mixed-feed kilns.

Only ash removal was through clinker separation, and the lime was highly contaminated with 10 percent silica, 10-12 percent Al_2O_3, .3-.4 percent Fe_2O_3 and 1.5 to 2.5 Mg. There was core, of course, and overburned lime as in all mixed-feed kilns where little attention is given to fuel distribution in the stone.

All lime was hydrated; two qualities of hydrate were made, a plaster quality and a building quality. Bagged, it is sold for about $10 per ton. The hydrator was nothing but a pit 20 ft. long, 10 ft. wide and 2 ft. deep. Quicklime was dumped into this and water sprinkled on with a hose. Temperatures through this pit-hydrator varied greatly, up to as high as 600 deg. F., the dissociation point of the magnesium hydrate. The high temperature indicates, of course, a lack of water, formation of coarsely crystalline hydrate and unhydrated lime. Hydrator lime-retention time was from 6 to 24 hr., but this was of no value; in fact, it was harmful due to insufficient water.

The hydrate is passed over the first screen and the product is bagged as plaster-quality hydrate. The remainder, containing most of the core and ash, continues to recirculate through a hammermill and second screen, and the product is sold as building hydrate.

The objection to the above system was low fuel economy, which they considered serious. Even though coal is cheap at the mine, it is not cheap when delivered to the kiln in relation to the price obtained for the lime. Labor efficiency was low but of little importance. Most serious is the poor quality of the hydrate, which causes an extreme amount of trouble from after-hydration.

One proposed solution to this extremely unsatisfactory state of affairs was to:

- *centralize production in a few plants
- *install gas producer-fired kilns to increase fuel efficiency to about 4 or 5:1 ratio
- *produce softburned lime leading to a better hydrate
- *make lime having no ash content
- *continue with pit hydration and later install either a proper silo hydrating system or a pressure hydrator.

The foregoing plan seems entirely logical, but what exactly happened in respect to which plant and how many, I do not know. I do know that a rotary installation did go in at a rather great expense. Whether this was correct for their conditions of low labor costs I doubt, but good lime must certainly be obtained now.

While in South Africa, I studied one of their larger high-calcium plants rather thoroughly. It is so completely different from any I had ever seen that for a long while I could not grasp it. First, I thought that it must be the world's most wasteful operation for its size: more than half the fuel was wasted, as well as all stone below 5 in., with 20 times too much labor. I passed through various

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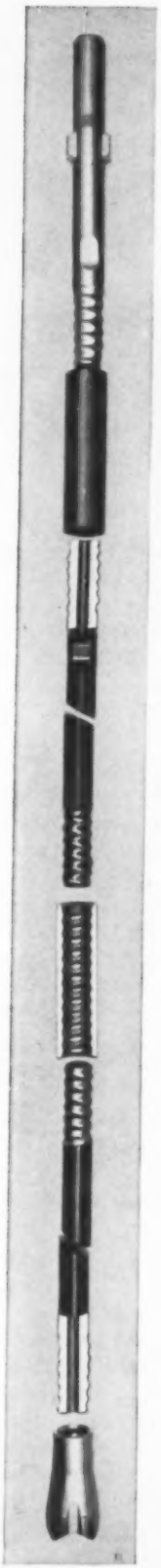
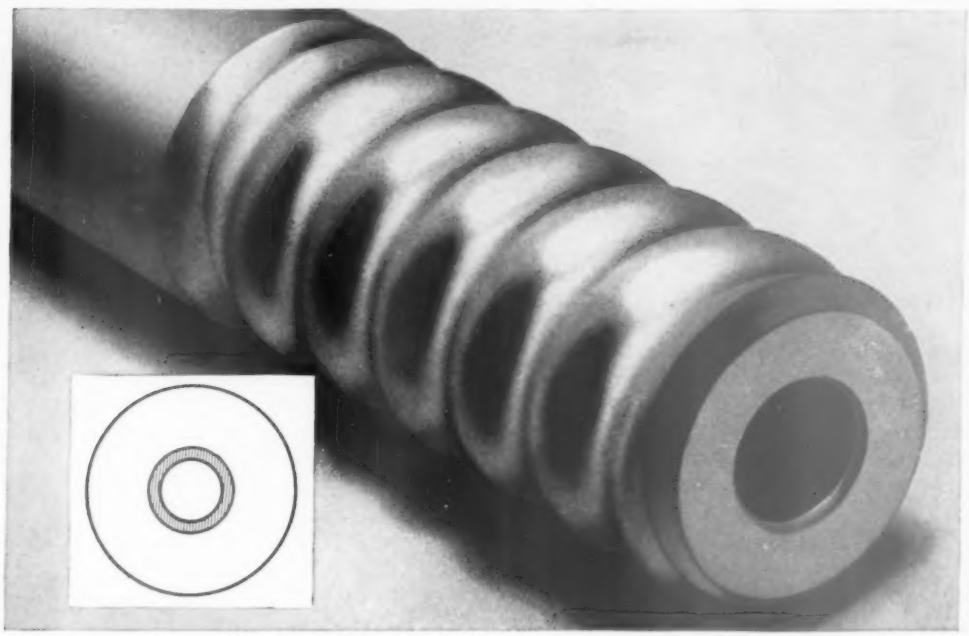


NEW ROPE THREAD MAKES UNCOUPLING EASY WITH SANDVIK COROMANT EXTENSION STEELS



Rope-Type Threads Afford No Starting Points for Fractures

Connections used in extension drill-steel must be easy to assemble and uncouple, and connections must not become weak links during the actual drilling. Sandvik Coromant's new patented rope thread makes it easy to join and uncouple the equipment . . . yet gives a solid and positive connection. The gently rounded form of this thread means trouble-free performance—eliminates common thread and coupling failures found in "saw-tooth" threads. The complete equipment—bit, rod, coupling sleeve and shank adapter—are all dependable Sandvik Coromant parts made of world-renowned Sandvik alloy steel. A futher advantage to the user is that the steel can be re-threaded. Atlas Copco has special literature on Sandvik Coromant extension steel and long-hole drilling, available to you with no obligation. We suggest you write today!

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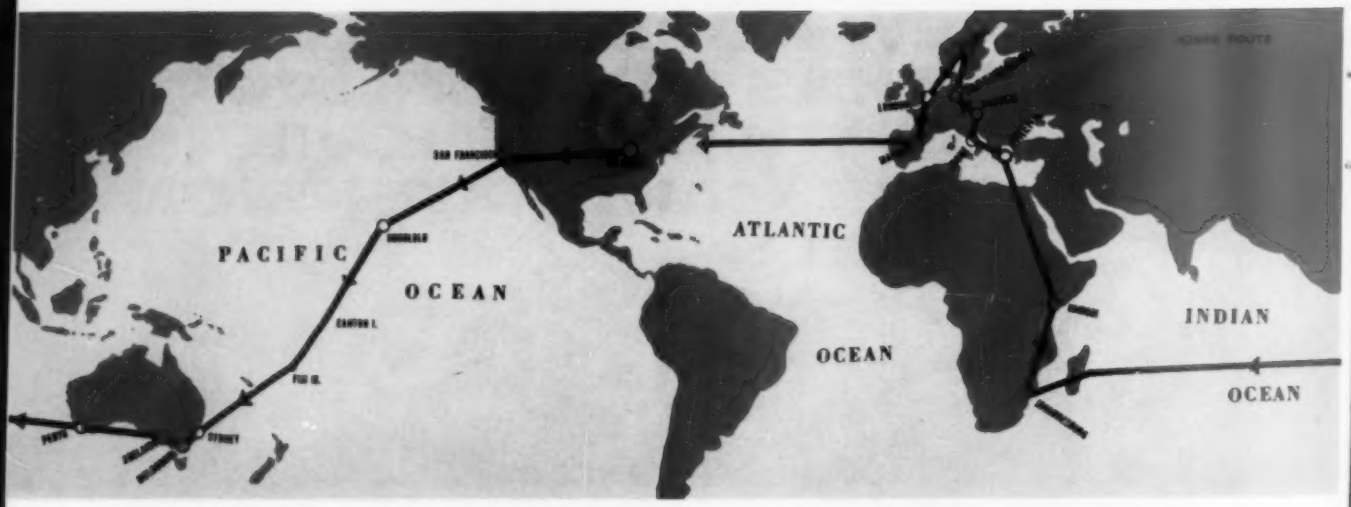

Lime production in Africa

continued from page 138

stages of opinion, deciding that the waste, while not entirely justified, was to an extent excusable; then finally I realized that it was a rather good plant.

A series of kilns with 11 x 56-ft. shafts produces about 30 tons per kiln per day. These large kilns should produce five times this amount of lime, and a higher production could readily have been obtained through some forced draft, lime draw and stone charging system modifications. But considering the nature of the stone, the resulting lime might not have been as good.

The kilns are of mixed-feed type; their fuel efficiency of 40 percent is low, for the best of such kilns have an efficiency of 80 percent. But coal, not coke, is the fuel and the heat of all volatile matter, up to 35 percent, is inevitably lost. Still, coal is the logical fuel and the cheapest. Coke, if available, would be too costly. Lime-fuel ratio is 4:1, and with coal delivered at $3.75 a ton the fuel cost is less than a dollar per ton, waste or no waste.

The kilns could be changed to producer gas-firing and the volatile matter would then be utilized. However, producer firing is not simple—a decisive factor considering their type of labor—and with fuel cost at less than one dollar per ton of lime, the change would not save enough to pay for itself. Anyway, these kilns are better than the dolomitic units; their production is about three times as great, fuel ratio about double.

The most certain improvement could come from the saving of small stone that is now wasted. Stone of 1½ to 5 in. could be charged by a simple scheme to the outer periphery of the kiln shaft. This charging would be without fuel, as sufficient heat would penetrate to the side of the shaft to calcine such small stone. By this means the small stone now wasted would be utilized, kiln production would be increased, fuel economy improved and labor used to better advantage. It would also be humane to arrange the kiln tops so that the dozen or more charging men would not be directly exposed to the acrid smoke.

In the United States and Canada, much attention is paid to labor required due to the high wage rate. It is roughly assumed that one man saved per shift, that is, three men per day, saves $10,000 per year. Then at least $40,000 may be spent to eliminate these men. We have some vertical kiln plants in the range of 200 to 250 tons of lime production that are operated with around 35 men, inclusive of all quarry, kilns and hydrating departments. If built new and properly planned, the plants may require even less labor.

It is this high productivity that makes the high wage rate possible: a production of one ton per man-hour at a labor cost of $2 per ton. What a contrast this is with the conditions prevailing in this South African plant, where the use of labor is unbelievably high, with—as it is bound to follow—the wage scale unbelievably low.

The Negro employes were paid $18 a month, some possibly $20. The Europeans, all Afrikanders, received approximately $175 a month, some receiving more. The labor in hours per ton was 26 times more than ours would be. Cost of labor per ton of lime came to about $3.30 just in plant labor. There were other workers at the main office in this African plant just as there would be in our case.

We say, "They should pay more." But how can they? They employ so many. We may say, mechanize and reduce the labor by 600. But there are

Please turn to page 143

E-M-pioneered Incher provides quick, safe spotting of mills. It turns mills literally inch-by-inch to desired position merely by pushing a button. One E-M Incher Control can be used to spot several mills.

At Carbon Limestone Company...

"E-M INCHER SAVES US $1,600 A YEAR"

... cuts starter maintenance by over 90%

● At Carbon Limestone Co., Hillsville, Pa., a limestone pulverizing mill must be stopped and spotted every four hours for lubrication. Spotting formerly took about 15 minutes and was done by "jogging" (flicking the starting switch to give the mill a momentary jolt of power). This slow, "hit-and-miss" method resulted in frequent production halts for repairs to the overworked starting system.

To remedy this situation Carbon Limestone installed an E-M Incher. Result: Push-button spotting requiring only *one minute*. In the words of General Superintendent U. F. Masson:

The E-M Incher ... *"Increased productive hours of pulverizing mill 30 minutes in each 8 hours or 6¼%. Reduction of maintenance of starting equipment 90%."*

The E-M Incher can save you big money, too, if you are now using one of the old, time-consuming methods of spotting synchronous motor driven mills.

Write the factory now for complete information about the Incher, and call your nearest E-M Field Engineer.

This mill at Carbon Limestone Co. is quickly positioned by the E-M Incher Control shown in the large illustration.

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Specialists in making controls do
EXACTLY WHAT YOU WANT THEM TO

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Fairbanks-Morse Type Registering Beam delivers punched weigh tickets; features large etched figures on chrome plated face plate, angled 45° for fast, easy reading from natural standing position.

Here is a modern weighing idea that is catching on fast all over the country:

Load this rugged, simple, compact F-M Portable scale on a flat bed truck and haul it over any highway—right to your job site! No pit is required; you can set it on timber or concrete footings on top of the ground if you prefer. To increase length, just place another F-M Scale unit in tandem and connect the weigh beam to both units. Famous Fairbanks-Morse Type "S" parallel link suspension provides extreme accuracy and withstands heavy shocks.

F-M Portable Vehicle Scales are regularly equipped with either full capacity beam or type registering beam, but may be equipped with automatic dial and Printomatic. Standard models are available in 8 sizes from 20′ x 10′ to 60′ x 12′, and in capacities of 20, 30, 40, 50, 65 and 80 tons. Find out now how this streamlined system of on-site weighing can fit profitably into your operations. Write Fairbanks, Morse & Co., 600 South Michigan Avenue, Chicago 5, Illinois for new Portable Vehicle Scale Bulletin No. ASM520.1A.

EASY TO LOAD, EASY TO HAUL!

Remove platform panels, disconnect transverse lever, tighten hold-down bolts—and standard models (1 and 2) become 8-foot wide units, ready to go anywhere. Wide frame models are simply loaded vertically for over-highway hauling, as in photo 3.

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Startling sights to a visitor from the United States—an idle giraffe and loafing lions

Lime production in Africa

continued from page 140

two quarries and three kinds of stone, one sorted by hand. The cost of mechanization would be so much that lime would cost considerably more—not less. Besides, 600 men would lose their jobs, resulting in only more dissatisfaction and racial dissent. It would not be politic nor humane; the $15 or $18, after board is deducted, is a considerable sum to the native when he returns to his reserve after fulfilling his six-month contract period of employment.

Strange as it seems, when kiln efficiency is poor but coal is cheap, to improve it by modern means may increase the present low fuel cost of lime. Kiln production is low but kilns are simple to operate and fitted to their type of labor. Labor cost is excessive, but mechanical equipment investment and upkeep costs are low. A reasonable profit is obtained, while lime is still sold cheaply and for considerably less than cement. All is as it should be except that the small stone now wasted should be utilized.

Under the South African Council for Scientific and Industrial Research, the country's various and many research, development and standardization endeavors are well organized. The National Laboratories in Pretoria are well equipped and well staffed.

One of the divisions is the Building Research Institute, which is headed by N. Stutterheim. Mr. Stutterheim received his specialized training under the noted teacher Rune Hedin, of the Swedish Cement and Concrete Research Institute at the Royal Technical University of Stockholm. A pressure hydrator designed by the Building Research Institute staff is now in successful operation.

T. L. Webb is the principal research officer and the one most familiar with lime; he is an intense individual, completely dedicated and absorbed in the subject. He is well known and well thought of by many in America, having been sent here for six months by his government to study our lime manufacturing processes.

Both of these men, Stutterheim and Webb, are of great help in guiding their country's producers, not impersonally as we do so much in this country, but through individual attention. The pressure hydrator and lime specifications are results of their efforts. Research is being done, lucid reports are being issued on hydration, on rapid methods of analysis and on a new and rapid manner of determining plasticity. Some have been published in this country: all are worthy of attention by lime men of the world.

I believe more good can come from such institutions as this and the South Australian Research and Development Institute, which are small but are in intimate contact with the personnel and problems of the producing plants, than from some of our much larger institutions. But a medium is needed for wider dissemination of developed information of these and other institutions.

I was the house guest of an English plant manager and his pleasant wife and we became good friends. This was an experience. His quarters could be classed with a baronial estate, and no other lime plant manager has the equal—a mansion of extensive proportions in landscaped surroundings of gardens, swimming pool, tennis courts and barbecue facilities, all thoroughly fenced in and guarded at night by dogs.

The premises are staffed by numerous servants, eight, I believe. Splendid service, exquisite cooking, flower-bedecked serving tables, silver and

Please turn to page 155

Efficiency

continued from page 97

percent) in combined industry answers was better service, particularly service on parts. One producer suggested that manufacturers should stick to delivery promises and should send equipment, parts and accessories correctly as ordered. "There are too many mistakes. The buyer can be put in a jam many times," he said. Another commented specifically: "At least 75 percent of the time the part is sent to the wrong address or the wrong part is sent. These breakdowns are expensive."

Almost a quarter of the combined industry answers suggested the manufacturer improve equipment efficiency generally, while 15.4 percent suggested the use of better and heavier materials for longer life. One sand and gravel producer had a good specific answer: "By making on-the-job surveys and consulting with the men that have to operate their equipment." Other answers included these suggestions: put more speed into equipment; better literature and instructions; and simplify equipment for maintenance purposes.

Apparently there is some dissatisfaction with manufacturers among those producers who answered the survey. However, we also know the tendency to report occasions on which difficulty has been experienced. In general, we might add, the feeling is that manufacturers have a big stake in the improvement of equipment to give the producer an opportunity for greater efficiency, and that he is doing a good job. We think that the following quotation from a manufacturer represents the average feeling among both producers and manufacturers. And we feel that in most cases this thought was implied from the survey results. "We are stressing the thought that producers and manufacturers must work together more closely today than we did ten or more years ago. The problems are more complicated, implying that neither one working alone can be assured of the correct solution without encountering considerably greater costs in time and money in solving the problem."

We asked additional questions on how producers have improved efficiency through improvement in maintenance, power uses and cost, improved product quality, and others. The individual answers were too numerous to mention, but all of them pointed to the fact that management is really giving the green light to more intensive thinking on all methods of improving production and productivity. Significant is the fact that 35.7 percent of those replying stated that better preventive maintenance has paid off for them. Almost 40 percent said that improvement in power uses and cost had been obtained through the best selective use of various types of power.

The importance of improved product quality is greater than you think. Combined industry answers indicated that 56.5 percent of the producers had reaped benefits through improved product control methods and equipment. A definite accent here showed up in the sand and gravel industry; more than 70 percent of producers replying said this method was used with good results. This implies that producers are working overtime to meet more rigid specifications, to improve quality for better ability to compete, or to upgrade products for improved value and price.

Of particular significance is the tone reflected in many of the answers to the general problem of production improvement. A need for closer supervision and more education of supervisors and employes was stressed several times. In one case, a company completely reorganized its various departments in a successful effort to reduce overhead expenses. In another, this specific suggestion was made: "Teach cost monitoring to all supervisory employes. Know what each operation costs, which is best and lowest-cost way, then pick the most economical." This, we believe, sums up the whole problem of production improvement. It is vitally necessary, first, to get that improvement in order to survive. Secondly, it is necessary to make a complete study of the cost facts surrounding each operation, to study them and to come up with the best answer costwise.

The editors wish to take this opportunity to express their sincere appreciation to the great number of those in the sand and gravel and the crushed stone industries who took time out of their busy days to reply to the survey. Without that important assistance, it would have been impossible to bring you this report.

END

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3 ADVANCED FEATURES in the CASE® W-9

A free demonstration will quickly convince you that the Case W-9 Terraload'r has all the money-making features found in the most modern 4-wheel-drive loaders — PLUS *three major advances* that enable it to outperform competitive loaders costing up to $1000 more. Here are the facts, which we'll gladly *prove* anywhere, anytime:

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You won't find this feature in the specifications — BUT the minute you get behind the wheel of a W-9, *you'll know what we mean.* There's no bucking or raising rear wheels off the ground when loading . . . less tendency to dip forward or sway sideways when traveling or dumping. Result: you move more material, in less time, with greater safety.

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Note that booms and cylinders on the W-9 *never pass the operator's compartment.* Result: operator has unobstructed visibility in all directions . . . can easily get on or off machine anytime . . . never needs to worry about catching arm in lifting mechanism.

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Denny-Simpson Stone Co.
Harrisburg, Ill.

"Replaced two power shovels"

"The W-9 replaced two more expensive shovels and not only speeded up our truck-loading operation, but cut maintenance and operating cost. It's geared for greater speed and moves around the pit fast. Visibility is especially good."

William B. Taylor
W. B. Taylor Sand & Gravel Co.
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"Doubled our production"

"We bought a W-9 to speed up our operation and cut down on help — and have found it is the best machine for the varied work we do. It strips overburden, stockpiles, loads trucks, and cleans up around the crusher. Our W-9 has increased our production 100%."

Herman Leukhardt
Leukhardt Supply Co.
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C-TL-217

Zoning

continued from page 87

parts of the country—and it should. The biggest factor, on both sides, is a willingness to listen and consider and discuss."

Although there are some minor variations between the zoning ordinances of Los Angeles County and the city respecting rock products, both of them basically cover the following points:

1. Any area zoned for mining operations must be clearly marked by signs not less than 500 ft. apart.
2. The plant shall be operated as far as practicable to eliminate noise or vibration injurious or annoying to persons living in the vicinity.
3. Operations must be conducted in compliance with Air Pollution Control requirements.
4. Private roads must be maintained to prevent the creation of dust.
5. Plant operations must be at least 50 ft. from adjoining property.
6. Manufacturing equipment (except for primary crushing) must be at least 750 ft. from any residential zone.
7. No excavation can be steeper than 1 ft. horizontal to 1 ft. vertical.
8. Property must be enclosed by a suitable fence.
9. Plant can be operated only between the hours of 6 a.m. and 8 p.m.
10. Every operator must be insured against liability for at least $100,000.

Rehabilitation of mining land has not been a problem in Los Angeles because of the peculiar refuse disposal situation there. The smog problem forced the city to put a ban on home incinerators; this, in turn, necessitated finding areas in which combustible refuse could be dumped and covered. Abandoned gravel pits are ideal for this purpose and are much in demand by private scavengers who use the cut-and-cover system of dumping and burying their refuse. The filled property can then be used for parks, playgrounds or buildings with slab foundations. Rock operators can sometimes get more for the use of their abandoned hole than they received for the rock they took out of it.

So some of the problems found in Los Angeles are peculiar only to that sprawling metropolis. But most of them—as well as the solutions which have been applied there so well—are appropriate to almost any city in America.

"It's the responsibility of an alert planning agency to look far ahead," points out Milton Breivogel. "We should know where our resources are before urbanization comes in. For example, had we known in 1946 the extent and location of our

Please turn to page 150

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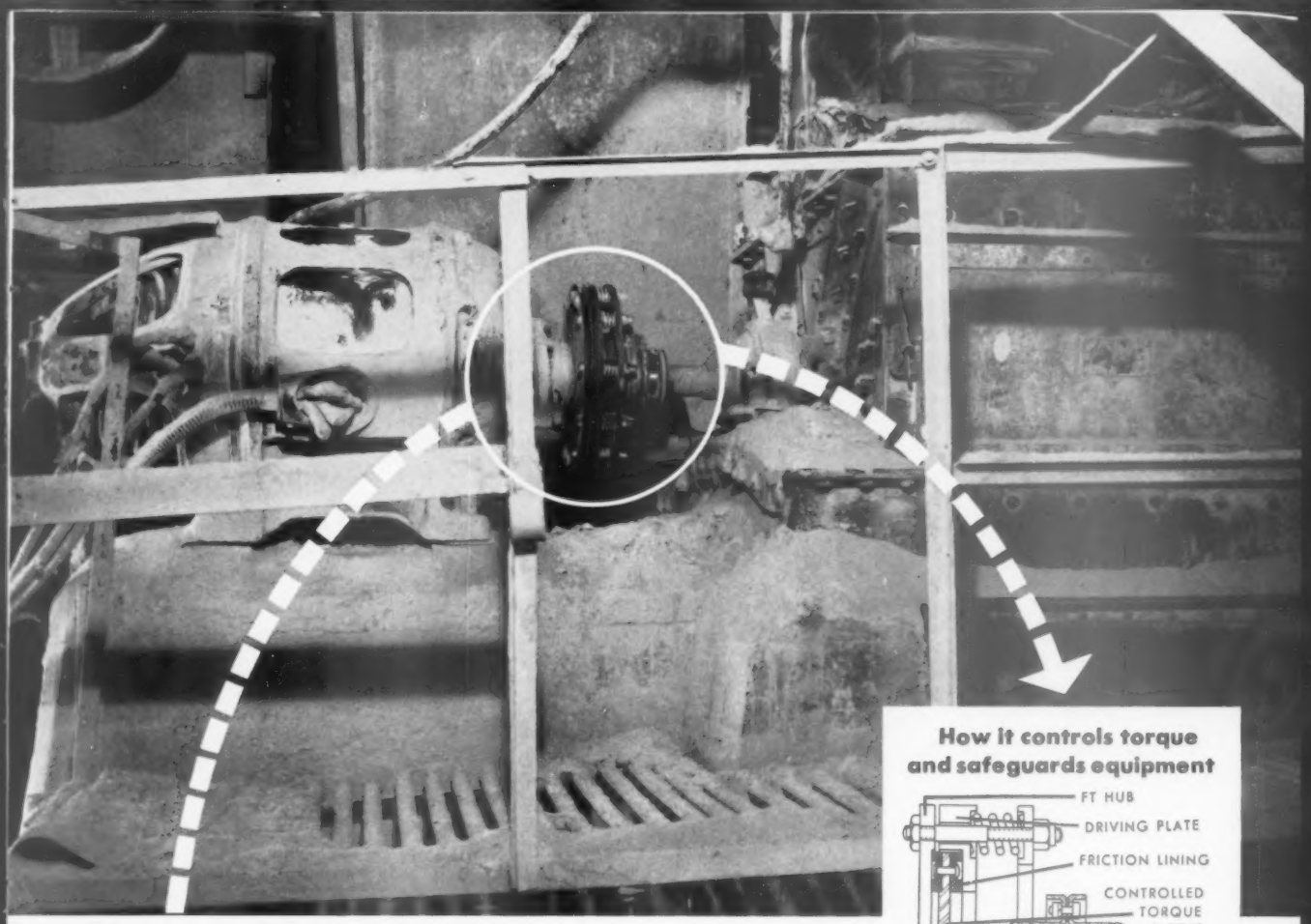
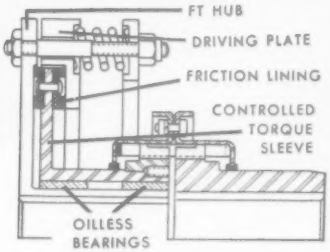


How it controls torque and safeguards equipment



Protect machines from overload damage with FALK Controlled Torque Couplings

The above picture shows a Falk Controlled Torque Coupling connecting a 150 hp motor to a hammermill. Formerly, when tramp iron got into the mill, it was necessary to rewind the motor at least twice a year. But, in the 2½ years after installing a Falk Controlled Torque Coupling, no motor repairs were required. *That is real saving!*

Wherever overload danger exists, a Falk Controlled Torque Coupling gives positive protection against machinery damage from excessive torque or jams. This unique coupling has an adjustable friction slip clutch which can be set at *any* predetermined torque limit. Thus, transmission of dangerous shocks is prevented...overloads are limited...shaft breakage is eliminated.

Another big advantage is that, when the cause of the overload is removed, the entire coupling will rotate and transmit power without resetting, and *without replacing parts or repairing the coupling*....And, the Controlled Torque Coupling incorporates the famous Falk Steelflex torsional resilience to smother ordinary shock and vibration, plus the ability to accommodate shaft misalignment....Consult your Falk Representative or Authorized Falk Distributor. **Ask for Bulletin 4100.**

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Here (as in photo), the torque-control hub is shown mounted on driving shaft. From this hub, power is transmitted through friction lining to controlled torque sleeve. Load to be transmitted is determined by the (pre-set) pressure on friction lining. In case of overload, this hub still rotates until power is shut off—but the rest of the coupling and the driven machine will slow down or stop.

Motor Shut-off Control

By adding an automatic cut-out switch with V-belt connection to driven shaft, motor can be stopped immediately. With the standard hub mounted on driven shaft, the switch opens the electric circuit when speed of switch falls below predetermined value.

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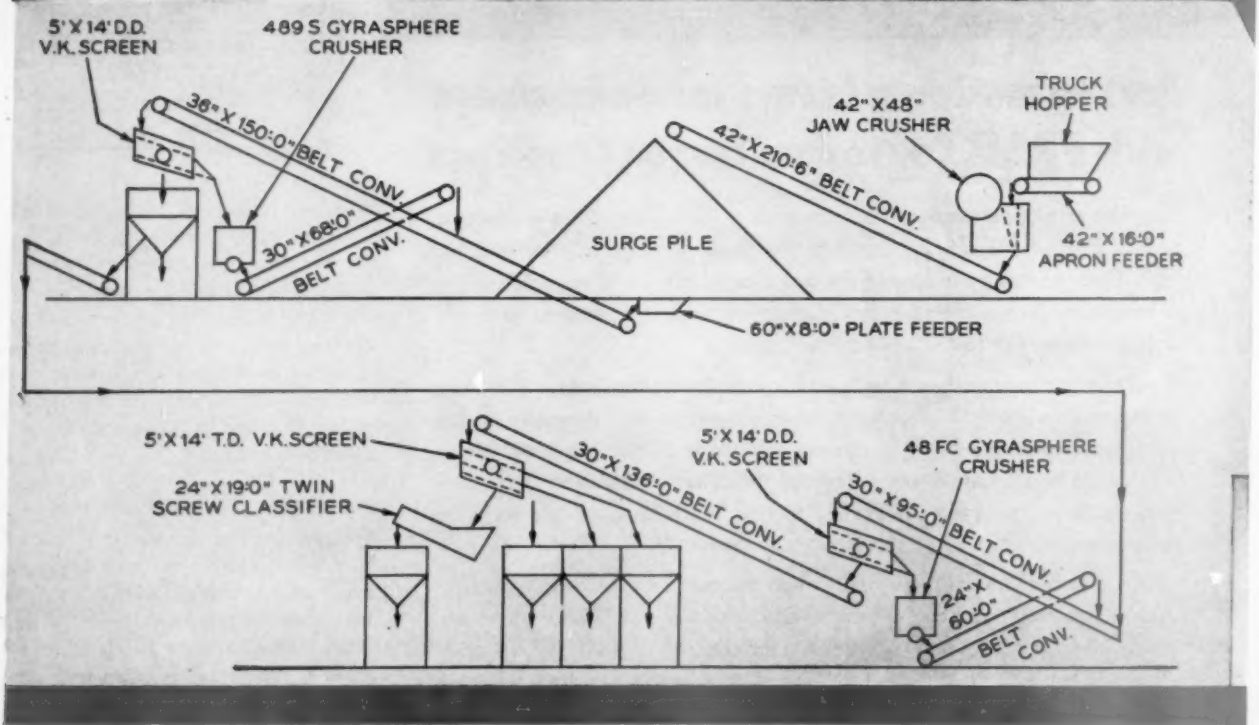

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FINISHING PLANT— **All Telsmith equipped**— makes 200-225 tons hourly of minus 1¼" material. Minus 1¼" plus ¾", minus ¾" plus 4 mesh, minus 4 mesh are typical sizes Other sizes are made by changing screen cloth.

Primary Plant works 10 hours a day. The Finishing Plant works 16 hours a day, producing 3 or 4 sizes for use in batch plants and for county and state highway construction. Send for Bulletin 266 describing Telsmith Complete Plant equipment.

Telsmith 5' x 14' Double Deck Vibro-King Screen and 489-S Gyrasphere Crusher.

Telsmith 5' x 14' Triple Deck Vibro-King Screen and 24" x 19' Twin Screw Classifier.

Q-36

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Zoning

continued from page 146

mineral resources as brought out by Mr. Gillelen's survey, we would have zoned differently."

Thus has Los Angeles made the best of what might have been a very bad situation. Other cities, where urbanization hasn't extended so far or so fast, can put a protective ring around their mineral resources at an even earlier stage than did Los Angeles. This is a goal toward which every rock products operator—in cooperation with other members of his industry—can strive. There's likely to be a counterpart of Frank Gillelen in most cities. And when you combine a Frank Gillelen with a mineral resources survey, an alert and enlightened rock products industry, and fair-minded public officials—then, you have the end of vexing zoning problems.

END

Compact stone plant

continued from page 132

tween a pair of 5 x 14-ft., wet, three-deck screens. Through-screen material is dropped down to the scalping tank where it is joined by other minus 3/16-in. material from the lower screens.

The products of these three-deck screens are the three merchantable sizes of coral rock: 1 x ½, ½ x ¼ and ¼ x 3/16 in. These are stored over a reclaiming tunnel 7 x 7 ft. and 360 ft. long with long, inclined belt conveyors.

Through material from the two final screens is minus 3/16-in. sand, which is classified along with primary-screen fines by a water scalper whose nine compartments discharge automatically. This unit is 10 x 32 ft. and has triple flumes. The three flumes provide a great deal of flexibility—all three can be discharged to a twin-screw concrete sand washer, or the material from either one of the two flumes handling fine material can be diverted to make masons sand.

Before passing to the water scalper, the masons sand passes over a 3 x 8-ft. single-deck vibrating screen, which removes oversize from the final product. This screen is tucked under the water scalper and above the double-screw classifier.

Both types of sand are stored on the ground, the concrete sand by a radial stacker. Both sand products are reclaimed for truck shipment by front-end loaders. The crushed rock is delivered from the reclaiming tunnel to a three-compartment truck load-out bin by two belts, a horizontal one in the tunnel and an inclined one to the bins. Each of the three compartments has a capacity of

Please turn to page 152

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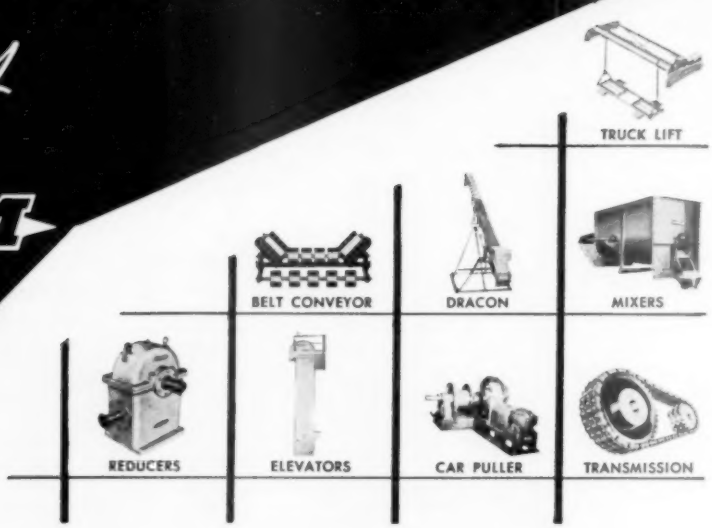

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Six 22-ton Euclid Rear-Dumps are hauling mortar stone, Portland cement stone and overburden at the Speed, Indiana, quarry of Louisville Cement Company. Working an 8 hour shift, three of these "Eucs" handle 400 tons per hour on hauls ranging from 1000 to 3000 feet. The wide bodies with struck capacity of 15 yards are loaded by a 4½ yd. shovel in four passes. Two other units are loaded by a 2½ yd. shovel. With loaded speeds up to 30 mph, they average 80 tons per hour on a 2 mile one-way haul. In addition, three of these "Eucs" work a second shift hauling overburden.

Louisville Cement Co., like hundreds of mine and quarry operators, has found that Euclid equipment moves more tons at lowest operating and maintenance cost. Dependable Euclid performance is the result of advanced engineering, rugged construction and almost 25 years experience with off-highway haulers.

To be sure you have the most economical hauling equipment, get a production and cost estimate from your Euclid dealer on the model best suited to your work — you'll find there are a lot of reasons why ***Euclids are your best investment.***

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When built, this dryer furnace designed and constructed by Plibrico was the largest hot air furnace in the world, outside the heat treating field . . . capable of drying 600,000 brick a day. You can get an idea of its size from the illustration.

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This installation called *"satisfactory in every respect"* demonstrates how you too can rely on Plibrico, not only for quality refractory products but also for competent engineering and installation service.

See how Plibrico refractory linings fit your needs by writing today for our catalog covering calcining, drying, and processing furnaces.

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Compact stone plant

continued from page 150

60 tons. A 4-in. pump supplies rinse water to a 4 x 12-ft. double-deck vibrating screen over the load-out bin; through-screen material is wasted to a flume.

Rockdale Concrete, Inc., operates a ready-mixed concrete batching unit at the new rock plant.

MAJOR EQUIPMENT USED AT ROCKDALE STONE, INC.

Plant design	E. Lee Heinrich, Jr. Designing Engineers
Wobbler-feeder	Universal Engineering Co.
Primary impactor, 36-45	Universal Engineering Co.
Secondary impactor, 32-40	Universal Engineering Co.
Surge bin	Iowa Mfg. Co.
Reciprocating feeder	Iowa Mfg. Co.
Screen, 3 x 8 ft., single-deck	Iowa Mfg. Co.
Vibrating screen, 5 x 14 ft., 2-deck, wet	Hewitt-Robins
Vibrating screens, 5 x 14 ft., 3-deck, wet (2)	Hewitt-Robins
4 x 12 ft., 2-deck, wet	Hewitt-Robins
Conveyors and belts (10)	Hewitt-Robins
Speed control (on primary feeder)	Sterling Electric Motors, Inc.
Water scalper, 9-spigot, 10 x 32 ft., triple flume	Eagle Iron Works
Sand de-waterer, double, 36 in. x 25 ft. (2)	Eagle Iron Works
Front-end loader	Frank G. Hough Co.

END

To win a market

continued from page 91

neighborhood of 1,200 deg. F. About 20 gpm. of water injected through a pipe with compressed air has done a remarkable job of lowering this temperature and improving the efficiency of the collectors.

The problem of collecting the dust itself was solved by continuously operating discharge valves. These valves are double-gate air locks operated by compressed air. Since they open and close mechanically, there is no accumulation of dust in the hoppers.

Clinker from the kilns is cooled to about 145 deg. F. in inclined reciprocating grate coolers. An oscillating conveyor system takes the clinker to a bucket elevator, which lifts it to a drag-chain conveyor in the storage building. This conveyor runs along the edge of the storage area and can discharge clinker at a spot where it is most accessible for the overhead crane operator.

Finish grinding capacity and flexibility is assured by the line-up of three 9½ x 26¼-ft. two-compartment ball mills. Each mill has a capacity of about 135 bbl. per hr. of type I cement.

These mills also have been equipped with automatic controls to regulate the total volume of feed. Once the ratio of gypsum to cement has been set, the load drawn by the motor on the bucket eleva-

Please turn to page 154

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Koehring Model 205 ½-yd shovel with Allis-Chalmers 273 engine loading copper ore at Tejano Mining Company in New Mexico.

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To win a market

continued from page 152

tor signals for more or less feed of these materials. The fine, finished cement is taken to one of the 32 storage silos.

The full capacity of each of these silos is "live" storage, since each discharges through gates in the bottom. The silos are built in rows of eight over four railroad tracks, permitting virtually continuous car-loading. The layout of the tracks gives plenty of room for handling a large number of cars without congestion.

Each silo is fitted with a quick-loading spout. A covered-top cement gondola can be loaded in less than 10 min. without contamination of materials. While the plant is equipped to make shipment of bagged cement, about 90 percent of its production is shipped in bulk by railroad.

The expansion of the Union Bridge plant is part of Lehigh's continuing growth program. Since 1946, the company has spent over $100 million for rehabilitation and expansion, and the end is not yet in sight.

END

Safety campaign

continued from page 128

collecting, sifting and analyzing reports to find out how, where and why accidents happened—the solid foundation on which PCA safety recommendations are built—never stops. The cement industry's chief safety problem right now is its injury-severity rate, which is quite high in comparison with its frequency rate.

Mr. LeGore likens the June No-Accident Campaign to Fire Prevention Week or Mother's Day. "Just because one week is set aside for fire prevention, you aren't indifferent to fire dangers the rest of the year," he says. "And Mother's Day isn't the only time when you remember your mother."

Today, cement manufacturing has one of the best safety records going. National Safety Council studies rank cement as one of the safest heavy industries. Within the cement association, 73 member plants, an all-time high, were accident-free in 1957. That's why the PCA's promotional ideas deserve the study of the rest of the rock products field.

END

"GYPSUM AND ANHYDRITE IN ILLINOIS" is the title of a study by Donald B. Saxby and J. E. Lamar. The information has been published as Circular 226 by Division of the Illinois State Geological Survey, Urbana, Ill., John C. Frye, chief.

Lime production in Africa

continued from page 143

crystal— all made possible at little cost by the cheapness of labor. But there was a cost, and a great one. Managing 600 irresponsibles is a big moral accountability for him to bear, and the family suffers from loneliness, with close friends many hours of travel away. They sit there in the evening and occasionally hear the ominous beat of drums drifting in on the wind—never a cheerful, and often a fearful, sound to the African white man.

From South Africa I was to have gone to Bombay, India, and then on to Haifa, Israel. But this portion had to be relinquished until later due to my urgent appointments in Norway and Austria. From South Africa to Norway it is 7,000 miles in distance and from summer to winter in climate. Entirely too much distance is involved in a direct flight, and a rest at some point along the route was called for. There were several interesting possibilities. As an old hunter, I chose Nairobi, where most of the big game hunters start their safaris after lion and other African game.

My good friends saw me off in Johannesburg on my SAS flight. The airline personnel have special ways of relieving the tedium and boredom of air travel. What made it particularly interesting was the spiraling flight around 19,270-ft. Mt. Kilimanjaro, the highest mountain in Africa. A complete circle was made of its twin-peak extinct volcanoes, capped with a glitter of snow and ice.

Shortly afterwards, we landed at the Nairobi airport, crowded with the greatest mixture of races and oddities of people I have even encountered. Nairobi is the capital of Kenya, where the recent Mau-Mau disturbances, now quieted, occurred. It may also be called the capital of Big Game Paradise. To shoot game now, it is necessary to go quite some distance, but to see and photograph game roaming freely about in its natural environment is quite readily possible. Kenya has a dozen or more large game preserves, one quite close to Nairobi.

The engulfing increase of population and the even more rapidly increasing cattle herds are putting the squeeze on the game preserves. The natives are decimating the wild stock through poaching for skins and plain slaughter; the cattle herds, through competition for water, blocking of migration routes and deprival of pasturage. Africa will not long be a game paradise, it will disappear as have our buffalo and the wild West.

With this Nairobi visit, I capped my African trip. It was a short but never-to-be-forgotten adventure. Now, by way of Khartoum, Athens, Zurich and Copenhagen to Oslo for an adventure of a different kind.

END

STOP FUEL WASTE!

Rising costs of production and shrinkage of profit margin emphasize the continued need for economy at every possible point. You can save fuel and improve kiln operation by providing your Burner with a continuous record of oxygen, carbon dioxide, and combustibles in the flue gas. A continuous record of oxygen permits complete control of the air supply; combustibles analysis indicates oxygen demand under all conditions; the carbon dioxide record reflects the state of the calcining process. Diligent use of the Cambridge Gas Analyzer results in lower fuel consumption, more uniform product and dollars saved!

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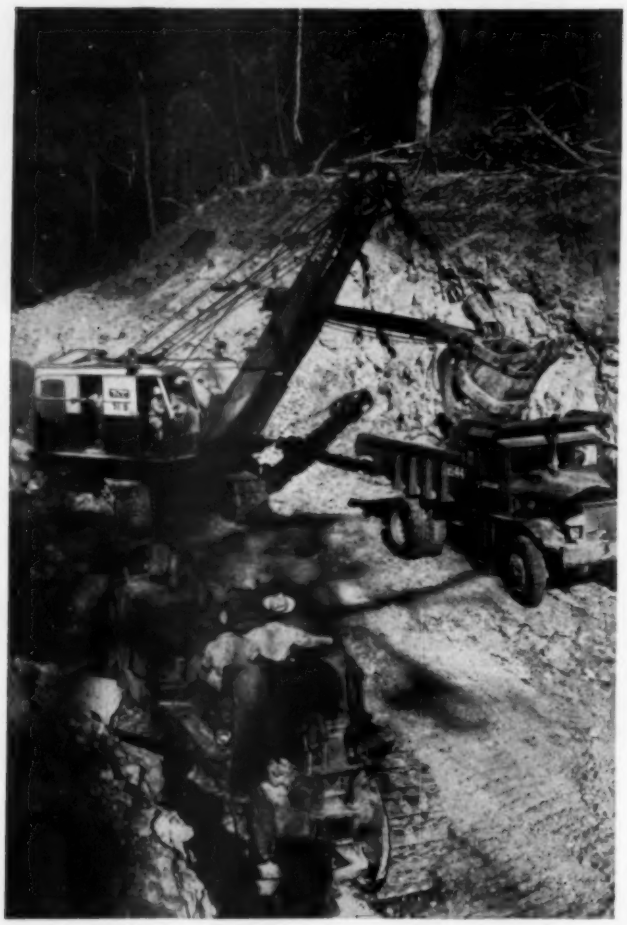

At Bucyrus-Erie, specifications for molding and core sands — permeability, compression strength, etc. — are rigidly adhered to in the production of castings. Here, a laboratory technician uses an electronic meter to determine the PH (acid-alkaline ratio) of the sand mixture.

Even though you usually do not consider the metallurgical makeup of a replacement part for your Bucyrus-Erie shovel or crane, it's an important question. But it's one you won't have to be concerned about if you buy parts from your *authorized* Bucyrus-Erie distributor.

Bucyrus-Erie spends many thousands of dollars every year in testing and developing materials for better wearing qualities under specific types of service. As a result, you get better shovels and cranes — and better parts — than were ever before available.

To make these quality parts available to you, Bucyrus-Erie Company annually *consigns* parts stocks worth millions of dollars to local distributor service shops — all built to original equipment specifications. No other manufacturer of shovels and cranes does so much to assure you of complete service.

Bucyrus-Erie also holds factory training courses to show your local distributor servicemen new ways to provide better service, new ways to make old machines perform at peak efficiency.

When you need repairs, don't gamble on "will fits". Call on the people who are best qualified and *most interested* in doing a good job. The money you save by corner-cutting may be only a down payment on losses you can suffer from breakdowns on key jobs. 2M58

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Your nearby Bucyrus-Erie distributor has a complete stock of original equipment parts for your machine. Fast follow-through on parts orders is a specialty of his. He's ready to give you speedy service right out on your job.

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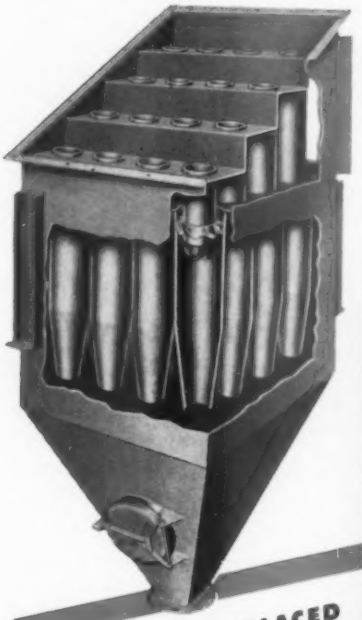
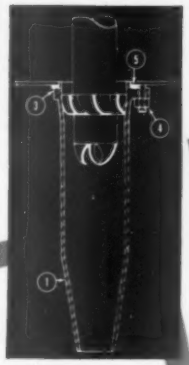


COST LESS TO MAINTAIN... ARE FAR SIMPLER TO SERVICE!

When you buy dust collection equipment, don't stop with a comparison of *initial* cost only. Compare also the costs and simplicity of keeping your dust collector at top-notch efficiency *throughout the years.* To the outstanding advantages of Multiclone's unique operating features, add the low cost and easy maintenance of this equipment and you'll see why Multiclones are the leading choice wherever *centrifugal* types of dust collectors are the most practical solution.



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1. **CAST IRON TUBES** assure long wear!
2. **SPECIAL ALLOY TUBES** (FBA Inco #40, Chromehard and Ni-Hard) can be supplied where high temperatures or severe erosion are problems!
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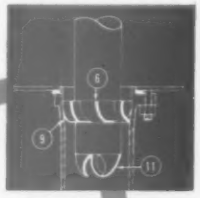
5. **GAS-TIGHT JOINT** between tube sheet and each tube is assured by special gasket. Joint can be easily renewed when replacing tube!



PRECISION CAST VANES!

6. **CAST IRON VANES** resist erosion!
7. **SPECIAL ALLOY VANES** (FBA Inco #40, Chromehard and Ni-Hard) can be supplied where high temperatures or severe erosion are problems!
8. **VANES ARE EASILY RENEWED** by simply dropping new ones into place when changing collecting tubes!
9. **EXACT FIT OF EACH VANE** in the tapered collecting tube prevents erosive "blow-by"!
10. **CAPACITY AND EFFICIENCY** of the unit can be quickly altered by simply changing vanes. Assures easy adaptability to new operating requirements — big savings in plant modernization programs!
11. **SPIROVANES** (energy recovery devices) may easily be added to outlet tubes of existing installations to increase capacity or reduce pressure drop!

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13. **BACKED BY OVER 3300 INSTALLATIONS** serving a wide cross-section of industry, each Multiclone benefits from the unequalled "know-how" gained during Western Precipitation's half-century of leadership in the highly-technical field of modern dust collection!

Compare the above advantages with any competitive equipment and you'll readily see why Multiclones are the logical choice for *your particular* operations, too. There's a Multiclone representative near you who will gladly supply further details to fit your individual requirements. No obligation, of course!

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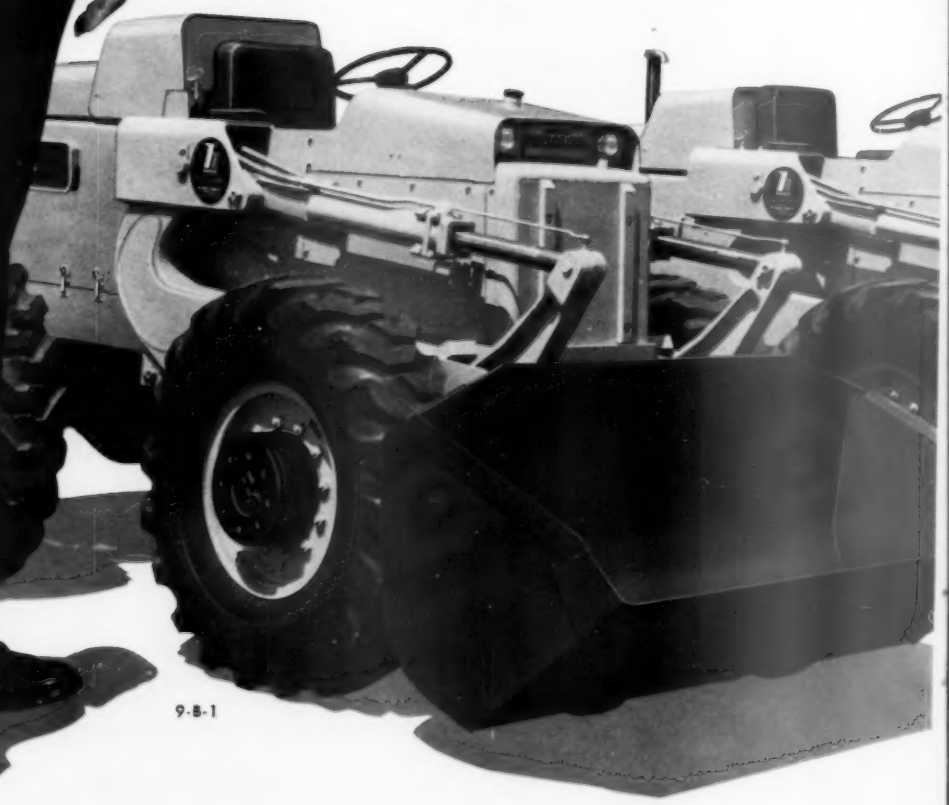
"Our program of continuous research and product betterment has made possible a number of improvements that make the model H-70 far superior in performance. These changes and what they mean in terms of improved tractor-shovel performance and satisfaction are pointed out in the following paragraphs."



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Greater power

New and more powerful engines, both gasoline and diesel, give you reliable power and plenty of reserve power. Diesel engines are available in either 2 or 4 cycle types.

More traction

New, better weight distribution with 1500 pounds more weight on the rear wheels provides more useable traction at all times — gives more push for greater digging power, better climbing ability and surer footing on mud, snow and ice.

Stronger throughout

Many components have been made stronger than ever, including main frame, boom arms and bucket linkage. The new front axle assembly is 40% stronger and the rear (steering) axle assembly is 80% stronger. These axles are wider and increase the side stability of the model H-70. They also include larger main shafts and heavy duty planetary final drives in the wheel hubs.

Greater protection

To assure fullest protection of the engine when operating in dusty conditions, the H-70 uses a triple air cleaner system consisting of a precleaner and two oil-bath air cleaners. A cartridge-type oil filter is built into the hydraulic reservoir. Similar filters also protect the engine oil and the transmission-torque converter oil. The front service brakes are sealed to keep out dust and dirt.

Larger, more efficient torque-converter

The torque-converter in the model H-70 is larger with ample capacity for the job and closely matched to the engine and transmission characteristics. It is the efficient two-phase type with a high torque-multiplication factor (stall ratio) of 2.72 to 1.

"Paylomatic" power-shift transmission

The model H-70 has the same Hough-built "Paylomatic" full power-shift transmission that has demonstrated its superiority on the model HH. With 3 speeds in each direction, it provides low powerful digging speeds plus high forward and reverse travel speeds up to 26 mph. Finger-tip shifting up or down in either direction without "clutching" or stopping for a range shift, speeds operating cycles on any job.

Power-transfer differentials

The use of power-transfer differentials as standard equipment on both front and rear axle assemblies continues with this model H-70. These special differentials insure reliable traction on mud, ice and similar conditions by transferring more power to the drive wheels with the best footing when slippage is encountered.

What about rated capacity?

This model H-70 like all other "PAYLOADER" models is rated, not by "Bucket Size" or "Lifting Capacity", but by *Carry Capacity* — the pounds of material that can actually be carried in the bucket at speeds up to 4 miles per hour. The Carry Capacity of this "PAYLOADER" is 7,000 lbs. and you will note that the "70" in the model H-70 designation indicates it's 7,000 lb. Carry Capacity.

Knowing the Carry Capacity is 7,000 lb., you can select the bucket you need from the many sizes available (from 1 cu. yd. to 2¾ cu. yd.) depending on the specific weight of the heaviest material you want to handle.

For example, a 2 cu. yd. bucket for handling materials weighing up to 3,500 lbs. per cu. yd. (2 x 3,500 = 7,000 lb.). Insist on knowing the Carry Capacity of the tractor-shovel you buy. "Lifting Capacity" — what it will lift standing still — and "Bucket Capacity" are not enough.

Powerful pry-out bucket action

The model H-70 has the famous pry-out bucket action that distinguishes "PAYLOADER" units from all other tractor-shovels in both looks and performance. Your Hough Distributor would like you to prove to yourself that the model H-70 will out-produce any tractor-shovel near its size. Ask him for a demonstration, and you be the judge. The Frank G. Hough Co., 705 Sunnyside Ave., Libertyville, Ill.

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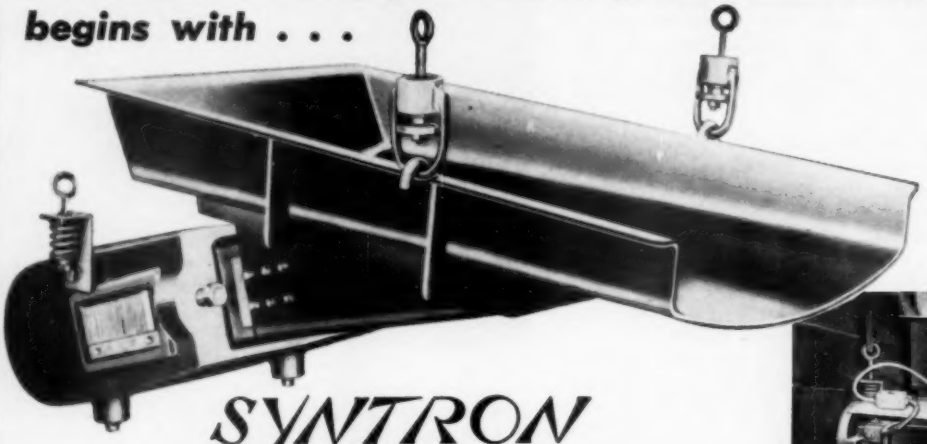

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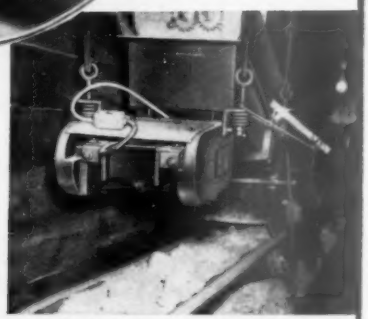
SYNTRON Vibratory Feeders combine efficiency, dependability and durability to provide controlled rate feeding of bulk materials—from fine powders to run-of-quarry rock, hot or cold, dry or damp—to hammer mills, crushers, screens, driers, ball mills and other processing equipment.

SYNTRON Vibratory Feeders are made in a series of single electromagnetic drive models with maximum capacities ranging from 25 to 1,000 tons per hour — and up to 3,000 tons per hour with multi-electromagnetic drive models. All with variable control of feed rate — for operation from 230 or 440 volt, 60 cycle a-c.

SYNTRON Vibratory Feeders can provide the dependable answer to a lot of your bulk materials handling problems.

Send details to our application engineers for recommendations and quotations.



Feeding run-of-pit rock to conveyor belt
Note: large rock and fines

Feeding damp sand to conveyor belt
Note: SYNTRON Vibrator on sand hopper

Other SYNTRON Equipment

designed to increase production, cut production costs, improve products

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Our representatives will be glad to work with you in selecting the proper equipment for your operation.

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ROCKY'S NOTES

(Continued from page 17)

from poor control of mixing water. If concrete intended to have a slump of 1 to 2 in. were allowed to be used with 6 to 7 in. [slump], the resulting strength reduction would be about the same as the difference shown in this investigation between average high- and low-testing samples from the same source. Recent data on strength-producing properties of coarse aggregates provide another basis for evaluating the contribution of cement variability to strength variations. Sixteen coarse aggregates, differing widely in origin and physical characteristics, produced compressive strength levels from eight percent below to eight percent above average in concretes of the same cement factor and slump. This range for completely different aggregates is smaller than that shown here for different shipments of cement from the same source."

The results of this investigation suggest two alternatives to the ready-mixed concrete manufacturer who to market his product must meet strict strength requirements, provided he must continue to cope with present conditions. He must thoroughly sample and test every shipment received and adjust the quantity of cement in his mix from batch to batch or at least day to day to fit the special variety of cement he may be using at the moment, and he must have storage capacity to hold several days' (maybe up to more than 28 days') supply while the cement is under test. Or he must demand that the manufacturer of the cement make a more uniform product, if this is possible.

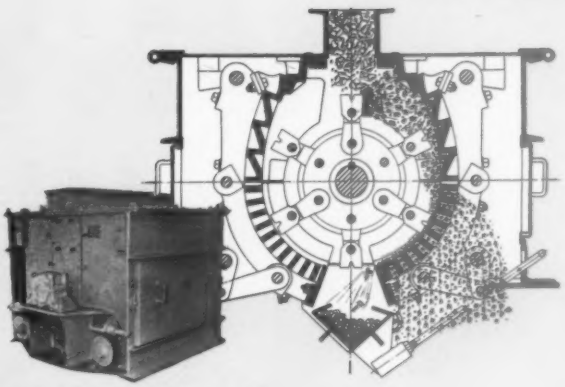
There are numerous reasons why portland cement varies in uniformity. Some of these can doubtless be corrected and will be corrected when demand and supply are nearer in balance than they have been the last few years. Apparently some lack of uniformity is seasonal. Thus cement made in the fall and winter, when demand in most of the country is usually slack and the cement plant silos are being filled, may tend to be of more uniform quality than during rush seasons when some or all cement made may be shipped without having received practically any storage. There is some reason to believe that silo storage improves cement, particularly the high limed cements made today, but whether storage alone improves the quality or not, putting cement in and taking it out of the silos is certainly a blending process, and saves making shipments of batches of extra "good" or extra "poor" cement, which apparently result even with careful control of manufacture. It is well known that slight differences in raw materials and changing conditions in the kilns and coolers during manufacturing operations can make appreciable differences in clinker composition.

On the assumption that ordinary care only was taken in the control of processing, it is conceivable that in times of more normal demand there would have been greater care exercised than during the past few years. The investigation report, we presume, refers to portland cements purchased by ready-mixed concrete producers in 1956, when there was reported to be a great scarcity of the product, and manufacturers were pressing both production personnel and machinery to produce more and faster. That may be a part explanation, but certainly not a satisfactory one, for no cement manufacturer who expects to stay in business during a buyers' market would knowingly risk the reputation of his product by making short-cuts even when conditions are such that he can get away with it.

Portland cement is only one of many mass produced commodities which are required to meet standard

(Continued on page 164)

CUT CRUSHING COSTS THIS WAY



Pennsylvania Reversible Hammermill

Nearly everybody knows that in many cases the Pennsylvania Reversible Impactor is the most economical and efficient mill for secondary crushing. But there are cases where the Pennsylvania Reversible Hammermill gets the call over the Impactor. This cousin to the Impactor also does a large amount of stone reduction by impact. (Note upper half of crushing zone above.) So when the pre-crushed material drops to the bottom of the mill there is a minimum of abrasive crushing action on the cage bars. This saves money. Also the expense and room needed for a closed circuit system is saved. Reversibility eliminates turning of hammers. Adjustable cage assures constant tonnage and uniform product for entire life of hammers and cage bars.

Pennsylvania Reversible Impactor

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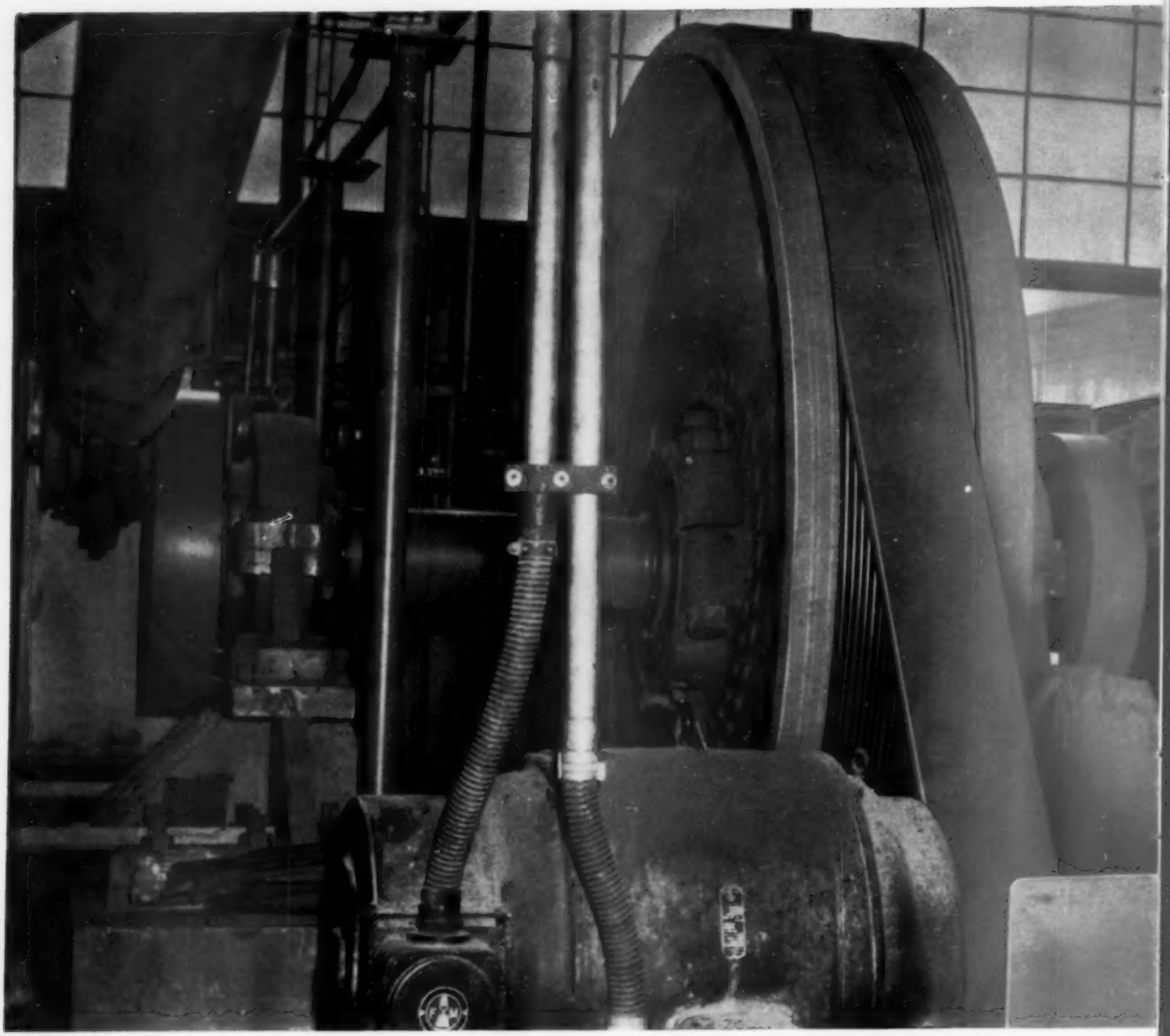

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- **Reduces Wear on Belt *and* Sheaves**
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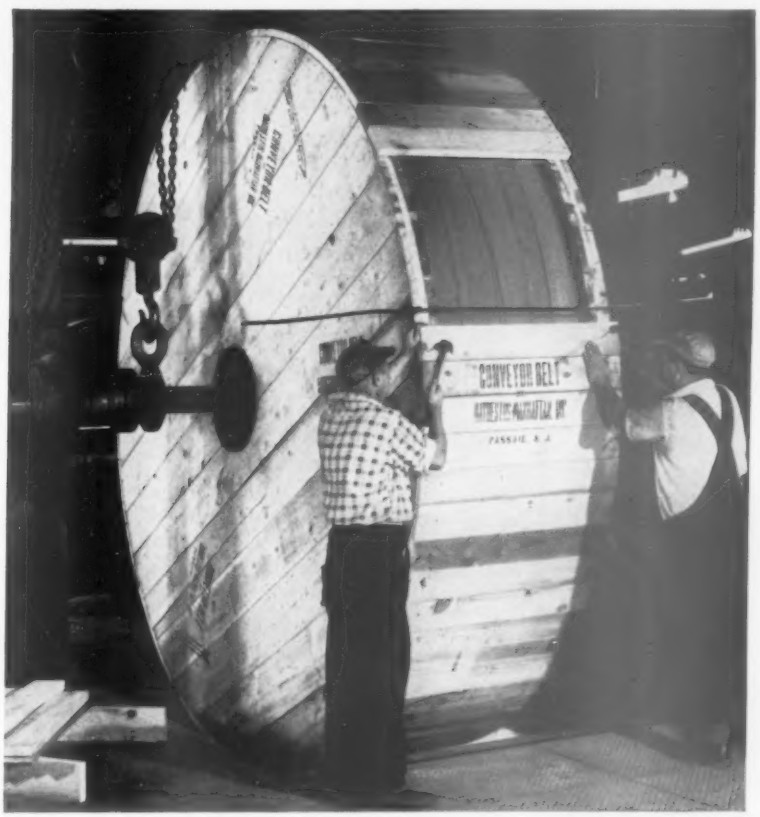

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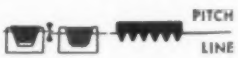

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ROCKY'S NOTES

(Continued from page 161)

minimum specifications; for example steel, salt, soda ash, etc.—commodities that are, like cement, used to make other products. Some of these requirements are physical and some chemical. Except for some government public works, portland cement has never had to meet other than physical requirements of strength and durability in the resulting concrete. Whether portland cement is meeting requirements more or less uniformly than other similarly produced materials we don't know. The variations in ready-mixed concrete selling strengths described in this report make it look wider of the mark than we would expect in a commodity, the manufacturing control of which has been so loudly touted.

We realize from the sales point of view of ready-mixed concrete manufacturers that 7 and 28-day strengths are very important. As a test of real quality of cement in ultimate strength and durability, we do not consider the 28-day comparisons at all adequate. The authors of this report say that even the 3-day tests give a pretty fair indication of what the cement will do in the 28-day test. However, their conclusions are based chiefly: That "except for cement source No. 6, there is good general relationship showing increased strength with increased percentages of tricalcium silicate. * * * * For source No. 6, the overall range in tricalcium silicate was quite small and the spread in fineness was greater than for any other source. These factors may account for the apparent lack of a relationship between tricalcium silicate and strength for that cement."

There is of course nothing new in proof that early strengths are closely related to the calculated tricalcium silicate content of the cement clinker. It is also entirely logical that the greatest variability in test strengths should occur in cements of highest tricalcium silicate content. In the first place, calculation of tricalcium silicate is based on certain assumptions that may be quite far from accurate. In the second place, formation of tricalcium silicate in the kiln is the most uncertain and difficult to control of the whole manufacturing operation. It is generally assumed that the tricalcium silicate is formed only after some part of the kiln charge has become liquid. According to Lea and Desch ("The Chemistry of Portland Cement") it takes about 2½ hours for the material to move through a 200-ft. rotary kiln, and for probably less than 20 minutes is the clinker in the zone where tricalcium silicate can be formed. This as-

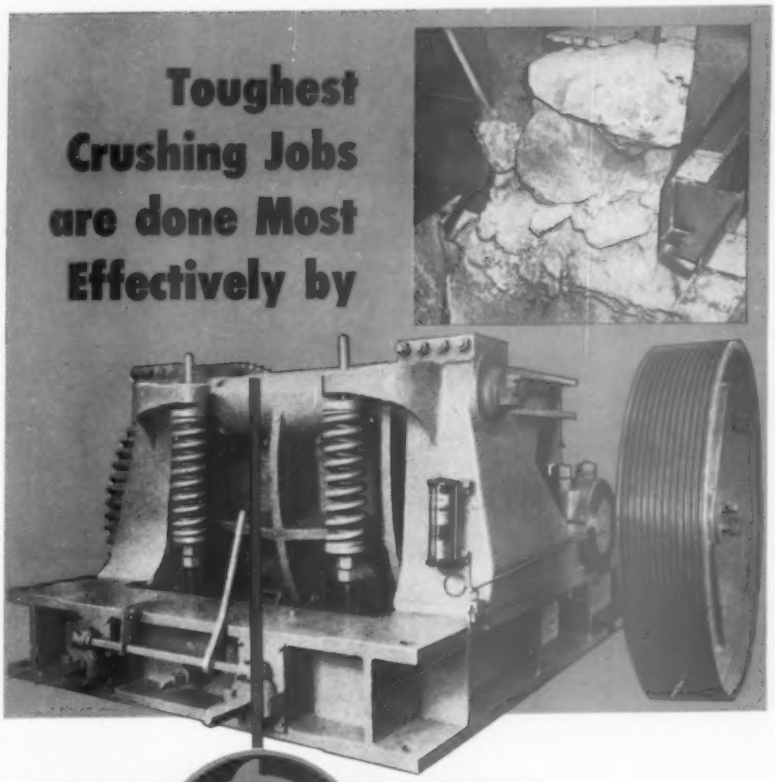
sumes that all the material moves through at a uniform rate of speed. It probably doesn't because the size and shape of the clinker particles must have considerable effect on its flow velocity. True, most new kilns are at least twice as long, but even a limit of 40 or 45 minutes is not any too long for this kind of reaction, if the liquid zone is lengthened when the kiln is lengthened; maybe it isn't.

The rate of cooling is also an important factor in determining how much tricalcium silicate is retained in the clinker; and there is no reason to believe this is uniform at all times. The lesser ingredients, alumina, iron and the alkalies, and the forms they take in the clinker, all affect the actual amount, if not always the calculated tricalcium silicate. The only thing, apparently, that the manufacturer or user is sure of in a cement with a high calcium silicate rating is that it has been loaded with all the lime that it can safely carry. That very fact makes it a more variable product because the character of the lime is the most difficult ingredient to account for in the finished product.

We are not expert in reading charts, and perhaps should not attempt to draw conclusions from those made by such recognized specialists in concrete, but it seems to us that cement from source No. 6, which had a fairly consistent low content of tricalcium silicate (that is, low by comparison with the others) in spite of its very considerable variability, was the most preferable cement in the group. It had only about 30 percent of calculated tricalcium silicate while the average of all the others appears to be considerably more than 40 percent, and about 40 percent dicalcium silicate against about 30 percent for the others. Certainly its 3 and 7-day strengths were relatively low, as would be expected, but its increase in strength at 28 days appears to have it almost as high as the average of the others. And, most important of all, its imperfection — its variability — was apparently caused by differences in the fineness of grinding. Here we have a defect that can be readily corrected. We hazard the prediction, that were the tests made on year-old specimens, cement from source No. 6 would have outstripped the others in strength, and given the most promise of a durable concrete. Maybe specification writers for ready-mixed concrete are themselves at fault in asking too high strength tests at early ages. Most ordinary commercial concrete does not require such high early strength, but all concrete is expected to be durable.

END

Toughest Crushing Jobs are done Most Effectively by



McLANAHAN SINCE 1835

ROCKMASTERS

- Steelstrut Toggle automatically protects against damage from uncrushable materials.
- Will handle wet, frozen, sticky, muddy materials.
- Continuous crushing—can be chokefed without primary grizzleys or screens ahead.

High-capacity Rockmasters provide best economy in the most rugged crushing applications. Efficient for primary and secondary crushing, Rockmasters have been proved outstanding on many materials—including limestone, various ores, cement rock, coal, gypsum, hard shale and all similar materials. Low headroom, automatic lubrication and roller bearings on countershaft.

Get All the Facts from this New Technical Data Bulletin No. RMTD-56

McLANAHAN & STONE CORPORATION

PIT, MINE AND QUARRY EQUIPMENT HEADQUARTERS SINCE 1835

252 Wall Street, Hollidaysburg, Pennsylvania

Enter 1254 on Reader Card

fastest growing acceptance in

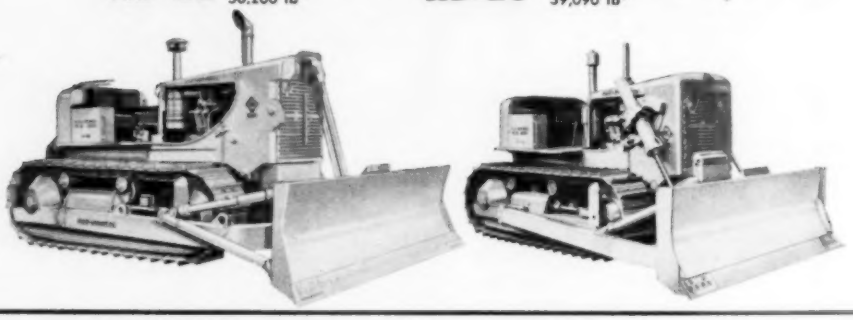
Allis-Chalmers crawler tractors for every application

...plus a complete line of matched bulldozers, side booms, mounted rippers, other attachments.

*All weights approximately as illustrated. Twelve other tractor models available.

HD-21 225 net engine hp, torque converter drive, 56,260 lb*

HD-16 torque converter drive, 150 net engine hp, 39,090 lb* | all-gear drive, 141 belt hp



Allis-Chalmers tractor shovels in a full range of bucket sizes...

up to 7-cu-yd capacity to match requirements for various materials and job conditions.

4-CU-YD HD-21G 225 net engine hp, 66,500 lb

3-CU-YD HD-16G 150 net engine hp, 47,800 lb

Allis-Chalmers motor scrapers and wagons...

five models that offer major advantages on big jobs or utility work.

TS-360
280 hp
Struck — 15 yd
Heaped — 20 yd

TW-360
280 hp
Struck — 17 yd
Heaped — 24 yd

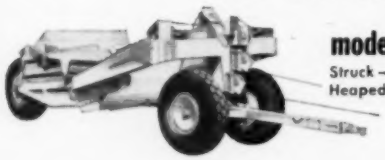
TR-260
200 hp
Struck — 11 yd
Heaped — 15 yd

Allis-Chalmers pull-type scrapers...

the only line with low bowl, high apron lift, forced ejection in every size.

model 315
Struck — 15 yd; Heaped — 20 yd

model 108
Struck — 8.4 yd
Heaped — 12 yd

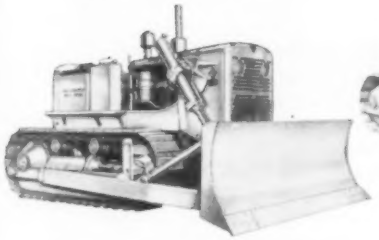


model 106
Struck — 6.1 yd
Heaped — 8.5 yd

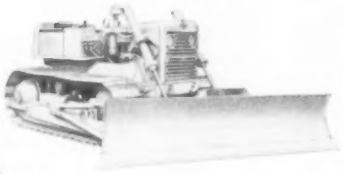
model 44
Struck — 4 yd
Heaped — 5.5 yd

the business . . . ALLIS-CHALMERS CONSTRUCTION MACHINERY

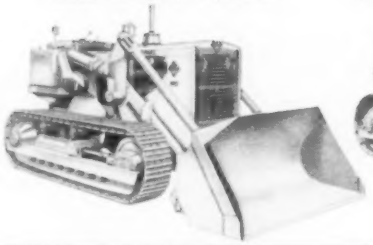
HD-11 94 belt hp 25,960 lb*



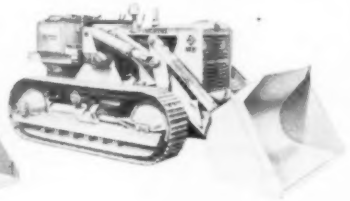
HD-6 63 belt hp 16,470 lb*



2¼-CU-YD
HD-11G 111 net engine hp 32,000 lb



1½-CU-YD
HD-6G 72 net engine hp 19,600 lb

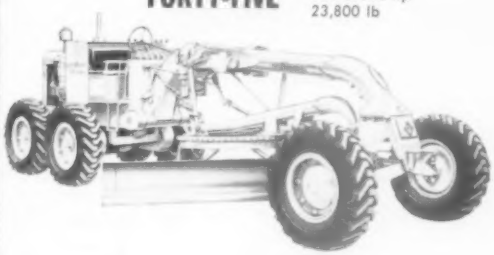


TS-260
200 hp
Struck — 11 yd
Heaped — 14 yd

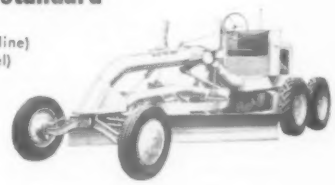
TS-160
155 hp
Struck — 7 yd
Heaped — 9½ yd

Allis-Chalmers motor graders...
designed for comfort-conscious operators and cost-conscious owners.

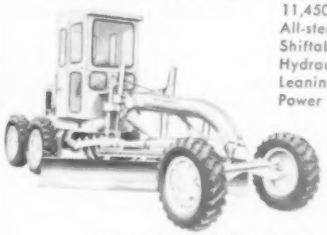
FORTY-FIVE 120 brake hp 23,800 lb



model D standard
50 brake hp
8,800 lb (gasoline)
9,350 lb (diesel)



model D special
50 brake hp
10,900 lb (gasoline)
11,450 lb (diesel)
All-steel cab
Shiftable moldboard
Hydraulic scarifier
Leaning front wheels
Power circle turn



ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION
MILWAUKEE 1, WISCONSIN

DESIGNED AND BUILT FOR HIGH-VOLUME PERFORMANCE YOU CAN DEPEND ON

Look ahead... *move ahead*...and stay ahead with ALLIS-CHALMERS

A-C ALLIS-CHALMERS

Enter 1273 on Reader Card

BONDED BUY

an exclusive of your Caterpillar Dealer

You *know* what you're buying from your Caterpillar Dealer. On used Cat-built equipment he offers you a "Bonded Buy" backed by his Guarantee Bond up to $10,000—your assurance of satisfactory performance and guarantee of all parts.

Look for the "Bonded Buy" symbol—*your* guarantee of the best buy in used equipment.

Ask your Caterpillar Dealer about his "Certified Buy" and "Buy and Try" guarantees on used equipment, too. For the *safest* buy on the market, see your Caterpillar Dealer.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

CATERPILLAR

Caterpillar and Cat are Registered Trademarks of Caterpillar Tractor Co.

BEST BUY IN NEW AND USED EQUIPMENT

Enter 1317 on Reader Card

NEW LITERATURE

Dust density transmitter

BAILEY METER CO. has released Bulletin E66-1 describing its Bolometer transmitter for transmitting measurements of relative smoke density, dust density, or turbidity to recording and/or indicating equipment at remote stations. Details of radiant energy detection principle of operation are provided along with installation drawings and wiring diagrams.

Enter 623 on Reader Card

Shovel

MANITOWOC ENGINEERING CORP. is distributing Form 2-58 describing its 3-cu. yd. Model 3600 shovel which can be converted to crane, dragline and clamshell applications. In addition to providing specifications, design and construction features are pointed out and discussed.

Enter 624 on Reader Card

Crushing machinery

TRAYLOR ENG. AND MFG. CO. has published the following booklets concerning its crushing machinery: Bulletin 6105 describes the Type H jaw crusher, and contains photos of various installations; Bulletin 6637 covers crushing rolls, indicating sizes, capacities and applications.

Enter 625 on Reader Card

Crusher slide rule

SMITH ENGINEERING WORKS is offering a slide rule to help plant operators select and buy the proper type and size of crusher for an aggregate plant or mill. Also, it shows a screen analysis of the product from each crusher when set with any proper discharge opening.

Enter 626 on Reader Card

Tractors

INTERNATIONAL HARVESTER CO. has issued Bulletin CR-1067-H covering its 330 and 350 Utility tractors. Features described include Torque-Amplifier drive, Hydra-Touch hydraulic system, independent power take-off, power adjusted rear wheels and Fast-Hitch method of coupling to implements and equipment.

Enter 627 on Reader Card

Vibratory feeders

SYNTRON CO. has made available a catalog containing data and specifications for its 13 standard vibratory feeders, three hydraulic and/or pneumatic feeders and spiral elevator feeders. Specially engineered models also are described and illustrated.

Enter 628 on Reader Card

Alumina refractories

WALSH REFRACTORIES CORP. is distributing a bulletin featuring its high alumina refractories for high temperature furnaces. General characteristics of Hi-Lumite fire brick are described as well as properties and typical uses, including burning zones of portland cement kilns and lime kilns.

Enter 629 on Reader Card

Sump pumps

THE ALLEN-SHERMAN-HOFF PUMP CO. has brought out Brochure 757 featuring its Hydroseal vertical slurry, sand and dredge sump pumps. Also described is the Maximix rubber lining for abrasive solids less than ¼ in. diam. and the all metal lining for abrasive solids over ¼ in. diam.

Enter 630 on Reader Card

Personnel elevator

HAWKEYE PRODUCTS CORP. has made available Catalog 852-D describing its demountable personnel elevator for use in cement, rock and other process industries. The car travels on a single vertical monorail, and on-the-job photos show it lifting workmen and materials up to 250 ft.

Enter 631 on Reader Card

Conveyor repair material

AUTOMATIC VULCANIZERS CORP. has published a manual showing how conveyor belt repairs can be made with its Pang cold self-vulcanizing material without heat, pressure or machines. Information is provided on splicing, repairing rubber covers, impact breaks, damaged edge covers and fabric breaks at edge.

Enter 632 on Reader Card

Welding positioner

WINCAR WELDERS has released a bulletin describing its Traktorol positioner for rebuilding tractor rollers and idlers by welding. Specifications are presented along with photos illustrating positioner features.

Enter 633 on Reader Card

(Continued on page 172)

MONEY MAKING IDEAS FOR YOU---FREE

USE THESE CARDS FOR MORE INFORMATION ON:

1. **Advertised Products**
2. **New Machinery**
3. **New Literature**

How to use:

Each advertisement in this issue is provided with a key number, so is each new machinery and new literature item. For more information on any of these items simply fill in the key numbers in the appropriate space on the adjoining card and send it to us. We'll do the rest.

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PERMIT NO. 1417
CHICAGO, ILL.

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ROCK PRODUCTS
79 WEST MONROE ST.
CHICAGO 3, ILL.

READER-SERVICE CARD RP-9-58

ROCK PRODUCTS
79 W. Monroe St.

SEPTEMBER, 1958
Chicago 3, Illinois

Cannot be serviced after Nov. 1, 1958 postmark.

Please print or type

Name_____ Position_____

Company (In Full)_____

Company Address_____ City_____ Zone____ State_____

MAIN PRODUCT OF PLANT_____ CAPACITY_____

[THIS INFORMATION WILL HELP US GIVE YOU MORE COMPLETE SERVICE.]

Send information on items identified by key numbers beside or below items of interest to you. List your choice in numerical order. Limit 10 per card.

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(6) ..... (7) ..... (8) ..... (9) ..... (10) .....

IF NO KEY NUMBER, USE COMPANY NAME

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IF NO KEY NUMBER, USE COMPANY NAME

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1. **Advertised Products**
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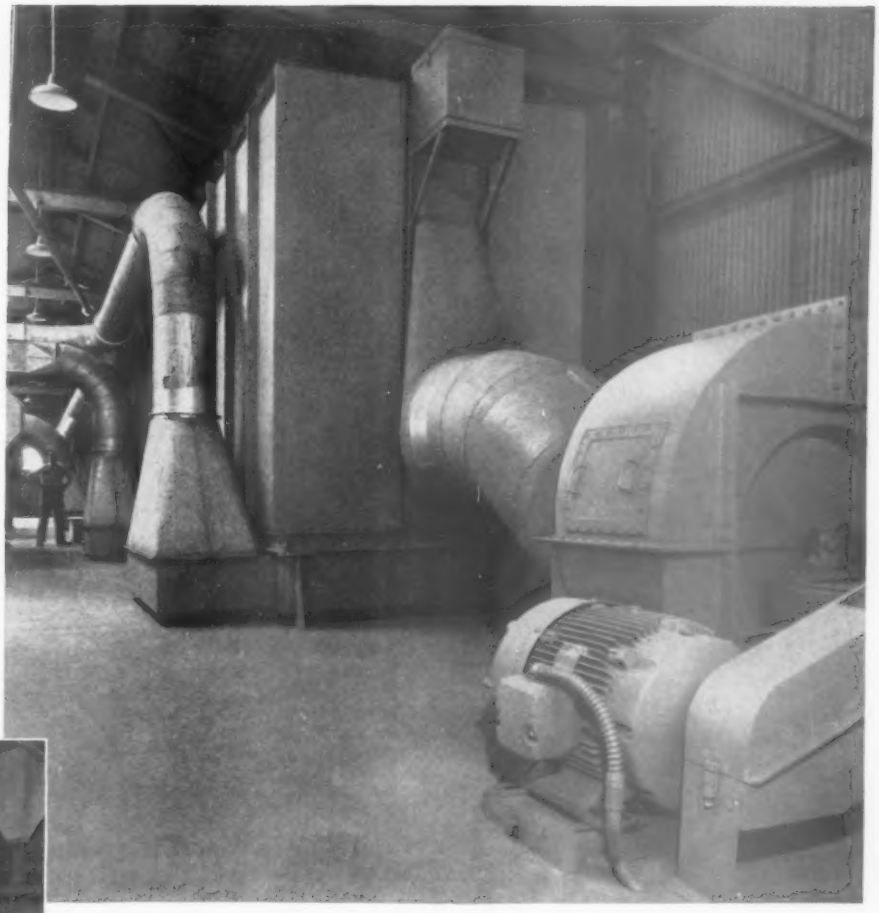


New standard of cleanliness is achieved in new refractory plant. Dust is trapped before it can escape, brought to this Dracco Multi-Bag Filter for high-efficiency collection.

Superintendent James E. Coffman of Harbison-Walker Refractories Company's new Hammond, Indiana, basic firebrick plant reports:

Dracco Dust Control keeps our plant *"clean as a home"*

In this new plant, Dracco Dust Control Equipment serves the entire manufacturing line, collecting any dust from crushers, grinders, mixers, screens, silos and handling equipment.

"By recovering the dust," says Mr. Coffman, "we keep the plant as clean and healthful as the average private home. Plant atmosphere is as pure as the air outside. We also gain virtually 100% production out of our raw material investment."

The Dracco system also prevents such dust-caused problems as abrasive wear of machinery, high plant housekeeping costs, reduced efficiency and material contamination. Performance benefits like these have led Harbison-Walker to specify Dracco Dust Control Equipment for many facilities.

For experienced assistance in solving your dust problems, call in a Dracco engineer today. Contact:

DRACCO DIVISION OF FULLER CO.

4060 East 116th Street • Cleveland 5, Ohio

Complete 40-page catalog on Dracco Dust Control Equipment contains detailed data and valuable reference material. Write for Bulletin 800.

DRACCO *airstream* conveyors
dust control equipment

FULLER COMPANY GENERAL

Enter 1271 on Reader Card

NEW LITERATURE

(Continued from page 168)

Metal hose

PENNSYLVANIA FLEXIBLE METALLIC TUBING CO., INC. has prepared a booklet describing its line of "Penflex" flexible metal hose and tubing. Construction features are pointed out and discussed and typical uses are suggested.

Enter 600 on Reader Card

Bin level indicators

BIN-DICATOR CO. has issued a catalog covering its three bin level indicators made for bulk material level indication and control. Included are photos and actual and suggested applications for the Bin-Dicator, diaphragm type indicator; Roto-Bin-Dicator, rotating paddle type; and Bin-Flo Aerator, to promote flow of dry, finely ground bulk materials.

Enter 601 on Reader Card

Tractor shovel

ALLIS-CHALMERS MFG. CO. has issued Catalog MS-1234 covering the design, engineering, construction and operating features of its HD-6G tractor shovel. Illustrations are provided, along with specifications and a list of interchangeable attachments that are available.

Enter 602 on Reader Card

Motor application guide

CENTURY ELECTRIC CO. has released its 1958 motor application guide, designed to simplify motor selection. Data on typical driven equipment, character of loads, starting and running torques have been matched to motor designs, types and descriptions, starting currents, speed and horsepower ranges and available enclosures.

Enter 603 on Reader Card

Dredges

ELLICOTT MACHINE CORP. has prepared Bulletin 935 describing its six basic types of dredges and their applications. Photos and profile line drawings cover the grapple, dipper, bucket, plain suction, self-propelled hopper and cutterhead pipeline types. Also explained are the "Dragon"(R) models. a line of standardized portable hydraulic dredges.

Enter 604 on Reader Card

Industrial gloves

THE PIONEER RUBBER CO. has released a pocket folder containing instructions for selecting the correct glove for a particular industrial application. Included is a glove selector check list and performance ratings as well as a wall chart giving specifications of each model as to material, weight and size.

Enter 605 on Reader Card

Shovel crane

LINK-BELT SPEEDER CORP. has published Catalog 2553 covering its 1-cu. yd. Model LS-98 shovel, crane, dragline and hoe. Illustrations describe the unit from the crawler tracks to upper machinery and the various front-end attachments.

Enter 606 on Reader Card

Thickener

DENVER EQUIPMENT CO. is distributing Bulletin T5-B6 describing its spiral rake thickener with enclosed, running-in-oil mechanism. Dimensions, specifications and features, including spiral rake which moves solids to center discharge in one revolution, an enclosed mechanism for reducing friction, large bearing surface, torque design and rake lifting devices are discussed and illustrated.

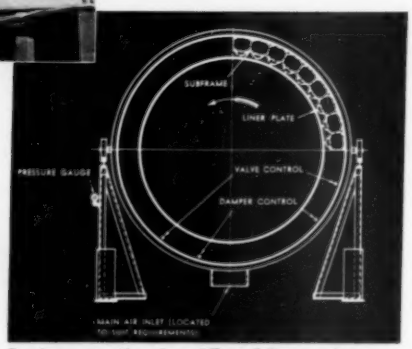
Enter 607 on Reader Card

END

Type S Recuperator applied to Unit-fired Rotary Cement Kiln

greater output and economy with a Manitowoc recuperator

- FUEL SAVINGS
- BETTER QUALITY
- INCREASED OUTPUT
- IMPROVED GRINDABILITY
- LOW COST



Front, cross section view of Type S Recuperator

Cement mills throughout the world are finding it highly advantageous and profitable to install a Manitowoc Recuperator. Attached to your existing kiln, it provides greater economy, an improved quality of cement, greater efficiency and increased output.

The type S design shown above is particularly suited to kilns requiring high volumetric air capacity and maximum output.

In all cases this Recuperator may be readily attached to an existing rotary kiln, requiring only a minimum of labor in erection, involving no foundation or brickwork and occupying a minimum of floor space.

It will pay you to get full information on all types of Manitowoc Recuperators. Find out how much they can do for you—and why it will pay you to install one on your kiln.

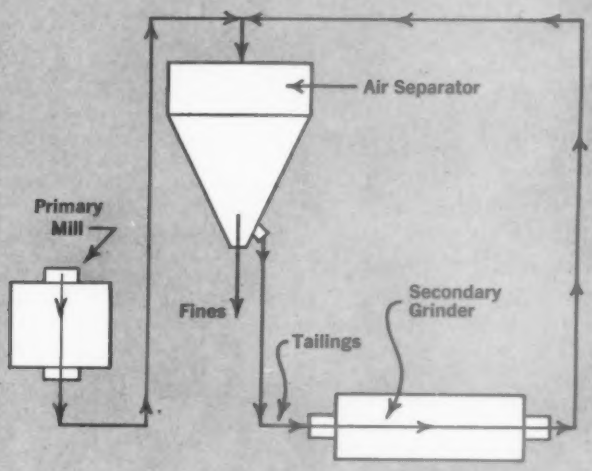
MANITOWOC SHIPBUILDING INC.

MANITOWOC, WISCONSIN

Enter 1240 on Reader Card

Stop Overworking Grinding Mills

FEED SPOUT
Sturtevant Air Separators come in 9 models, diameters range from 3 to 18 ft.
TAILINGS DISCHARGE
FINES DISCHARGE



Primary Mill runs open, starting circulating load through air separator. Desired fines are discharged, and oversize is fed to secondary grinder and then returns to air separator for further classification.

LET STURTEVANT AIR SEPARATION HELP YOUR SYSTEM PRODUCE UP TO 300% MORE 40 TO 400 MESH FINES — CUT POWER COSTS AS MUCH AS 50%

Fines that pass through grinding mills unhindered, serving only to increase the work load, can be quickly classified by a Sturtevant Air Separator operating in closed circuit. With all oversize automatically returned for further grinding, the result is production capacity impossible to achieve in single-pass grinding — as well as a better, more uniform product.

Closed circuit grinding and air separation is of proved advantage in *all* secondary reduction processes. Grinding mills are free to perform at top efficiency, their output frequently increased as much as 300% and power costs cut up to 50% (documented by 30 years of Sturtevant air separation experience in the cement industry). Further, attritional heat is dissipated by greater surface exposure.

Sturtevant Air Separators Keep Grinding Units At Peak Efficiency — Classify Feed Loads to 800 Tons Per Hour

Sturtevant Air Separators circulate production loads with exact control of air currents and centrifugal force. Simple adjustments make possible counter-action between the two to the point where a product of almost any desired fineness may be collected while coarser sizes are rejected.

A 16 ft. Sturtevant, for example, took a feed rate of 800 tph, containing only a small percentage of desired fines, and delivered 30 tph 90% 200 mesh, recirculating the oversize through the grinding circuit. (In the cement industry, Sturtevant units deliver up to 60 tph raw cement fines, 40 tph finished cement fines.)

Sturtevant's ability to engineer precise, high capacity classification for closed circuit grinding systems is the result of long experience with a wide variety of dry processes. Sturtevant designed its first air separator some 40 years ago — and has been pioneering developments in centrifugal classification ever since.

Current users of Sturtevant Air Separators include manufacturers of sulfur, soybeans, phosphate, chocolate, feldspar, sand, pigments, limestone fillers, abrasives, plasters, ceramics and cement.

Designed for precise separation of all granular materials, Sturtevant Air Separators have been adapted to other materials as well. Johns Manville, for example, uses a 10 ft. model to separate 3 to 6% undesirable rock from asbestos.

Ruggedly constructed, Sturtevant units are designed for minimum maintenance — at a Midwestern rock-crushing plant, a 10 ft. Separator operates outdoors year-round with only routine care.

For further information, request Sturtevant Bulletin No. 087. Write Sturtevant Mill Co., 102 Clayton St., Boston 22, Mass.

STURTEVANT

Dry Processing Equipment

CRUSHERS • GRINDERS • MICRON-GRINDERS
SEPARATORS • BLENDERS • GRANULATORS
CONVEYORS • ELEVATORS

Enter 1315 on Reader Card

GILSON TESTING SCREEN

SIZE-TESTS
CRUSHED STONE
GRAVEL
SAND
ALL ROAD AGGREGATES

Makes 2 to 7 separations simultaneously in five minutes or less per complete test. Size range: 4-inch to 200 mesh. Sand Attachment optional for handling 8-inch sieves.

Write for catalog describing Gilson Improvements and New Optional Accessories and Equipment

The Gilson Testing Screen is the Standard Sizing Control of the Industry

GILSON SCREEN CO.
MALINTA, OHIO

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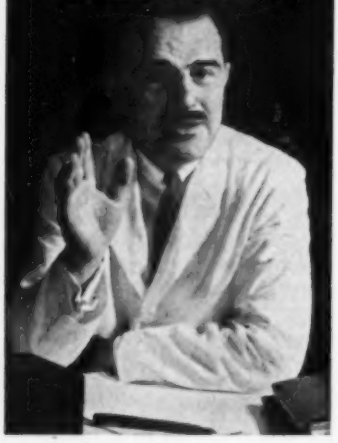
YOUR BEST CANCER INSURANCE . . .



a health checkup
once a year
every year . . .
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. . . for life.

American Cancer Society

NEW U. S. PATENTS

By OLIVER S. NORTH

Aggregates

2,831,294—In the pouring of molten **blast-furnace slag** into foaming beds to produce a cellular, lightweight product, the discharge side of the pouring ladle is provided with a collar forming a broad overflow edge. Thus, when slag is discharged from the ladle it will spread out over the foaming bed in a wide, flat stream. Material can be poured more slowly, and the "slag top," or crust, can be held back in the ladle. Bed so poured can be foamed uniformly. (to O. K. Vorwerk, P. F. Hüttemann and E. K. Schmücker. Assigned to Huttenwerke Rheinhausen Aktiengesellschaft.)

2,836,298—Improved inclined chute for use with a Symons vibrator screen used for the screening of **sand** and **gravel.** Large pieces of rock are vibrated upwardly so as to by-pass eccentric motion of screen and thus avoid the crusher. (to F. J. Tobin.)

2,836,299—Continuously operating apparatus for cleaning and separating clayey **sand, gravel** and the like into clean, properly-graded commercial products. A mixture of the raw material and water is jetted into a rotating drum wherein blades break up and mix the clay and mineral. Clay is washed out, while sand and gravel discharge to a second rotary drum wherein they are separated. (to E. Johnson.)

Cement

2,836,846—Process and apparatus particularly useful for pelletizing mixtures of **portland cement** raw materials. Pellets produced are dense and uniform. (to K. Meyer. Assigned to Metallgesellschaft Aktiengesellschaft.)

2,836,903—This apparatus for heating raw slurry prior to burning, in wet process manufacture of **portland cement,** is less liable to damage from stresses arising from temperature differences and equipment weight. (to N. E. Andersen. Assigned to F. L. Smidth & Co.)

Asbestos

2,836,848—Improved apparatus and method for making molded calcium silicate insulation materials, for example pipe covering, from a slurry of **asbestos** fiber, **lime, silica** and water. (to H. F. Zink, W. C. Taylor and C. D. Pawlicki. Assigned to Owens-Illinois Glass Co.)

2,838,246—Apparatus for defiberizing **asbestos** bundles, especially for production of fiber products suitable for making asbestos-cement products. (S. M. C. Adorno and G. Vercelli.)

Mineral wool

2,830,772—This **mineral wool** nodulator is capable of nodulating "tight" felts of long fiber without excessive fiber losses. (to R. F. Martin. Assigned to Johns-Manville Corp.)

Magnesite

2,831,574—Froth flotation method of treating **magnesite - brucite** ores, such as those of Nye County, Nev., to produce a low-silica, refractory-grade product. Ore pulp is subjected to mild flotation with a silica collector, for example "Armac S," to eliminate talc, chlorite and other flaky siliceous minerals. Pulp is then floated with a tall oil derivative or other magnesium collector to separate magnesite along with the granular siliceous material present. The limited amount of silica thus retained is desirable in refractory magnesia. The collector reagents used are relatively unaffected by presence of slimes or ultra-fine particles. (to A. J. Weinig and J. F. McIntosh. Assigned to Basic Inc.)

Clays

2,833,720 — Use of organophilic **bentonite** in a bodied lubricant. Addition of the cation-exchanged bentonite gives the lubricant good consistency and work stability. (to C. A. Stratton. Assigned to Phillips Petroleum Co.)

2,836,555—Method of making a material suitable for use in recovering lost circulation in wells. Material consists of pellets of compressed, dehydrated expandable **bentonite** coated with a water-insoluble coating, except for a small entrance. In use, the pellets are injected into the well, where water gradually causes the bentonite to expand and rupture the pellets, permitting the bentonite to swell into cracks and crevices in situ. (to A. L. Armentrout.)

(Continued on page 176)

Copies of United States patents are available at a cost of 25 cents each from The Commissioner of Patents, Washington 25, D.C. For convenience, coupons, each good for one copy of any patent, may be purchased from that official at the rate of $5.00 per 20-coupon pad or $25.00 per 100-coupon pad.

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LORAIN 85A

THEW LORAIN®

reliability in action

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NEW U. S. PATENTS

(Continued from page 174)

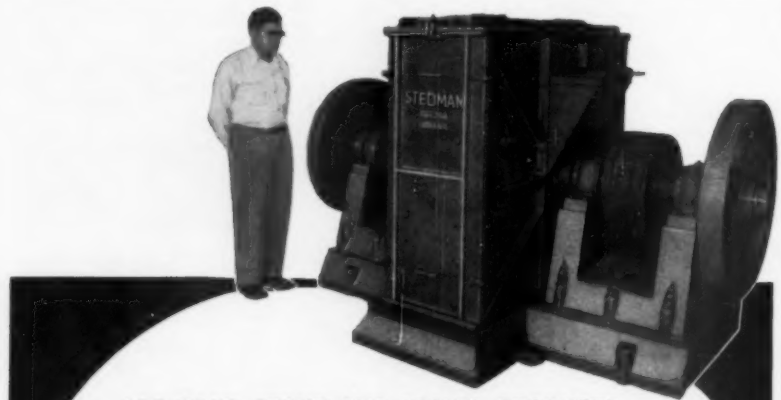
Graphite

2,837,412—In a process for increasing the density and imperviousness thereof, **graphite** is saturated with a liquid furan ring compound, contacted with aqueous hydrofluoric acid, and dried. (to G. A. Bennett. Assigned to U. S. Atomic Energy Commission.)

Potash

2,837,403—Process for recovering chlorine-free potassium carbonate and potassium sulfate from **langbeinite** without using potassium chloride as a reagent. Ore is mixed with petroleum coke, and the mixture ground, pelletized and heated to produce water-soluble potassium compounds and water-insoluble magnesium oxide. (to G. H. Gloss and W. J. McGinnis. Assigned to International Minerals & Chemical Corp.)

2,837,404—Production of carbonate compounds from liquors obtained in processing of **sylvinite,** potassium chloride and the like. (to A. G. Follows. Assigned to Allied Chemical & Dye Corp.)



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ARE THEY FREE OF SOFT STONE AND CLAY?

WILL THEY MEET SPECIFICATIONS AND PASS ABRASION TESTS?

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Miscellaneous

2,830,769—Apparatus and method suitable for drying or pulverizing solid materials, such as **talc, barite, oystershell, clay, marl, gypsum** and **limestone.** Material is slurried in a liquid and introduced into a vaporizing chamber, where the liquid is vaporized and a dispersion of solids in vapor formed. This dispersion may then be treated in any of various ways. (to L. T. Work. Assigned to Texaco Development Corp.)

2,830,883—In the production of gases from solid fuels, the sulfur content of the product gas stream can be reduced by addition of **lime,** hydrated lime or pulverized **limestone** to the synthesis gas generator. Lime is used in excess of the amount theoretically required for removal of all sulfur contained in the solid fuel used. (to D. B. Eastman. Assigned to The Texas Co.)

2,830,884—An improved abrasive mixture for finish grinding glass lenses consists of 50 to 80 percent specially graded Friant **pumicite** and the balance a harder component such as **emery, garnet** or, preferably, spheroidized white pumicite. Presence in the composition of the harder, more nearly equidimensional emery or spheroidized pumicite particles imparts "rolling" characteristics to the material and prevents binding of abrasive during the finishing operation. Spheroidized pumicite can be produced by blowing minus 100-mesh material through an oxy-acetylene torch, causing particles to fuse into perfect micro-spheres. The solid spheroidized powder is graded to minus 325-mesh for use. Oversize can be reground and re-fused. (to W. D. Smiley. Assigned to C. H. B. Morrison.)

2,832,691—A synthetic calcium silicate, produced by hydrothermal reaction of **diatomite** with a calcium-bearing material, is used in the manufacture of a compounding material that will plasticize and strengthen rubber and rubber-like compounds. The commercial synthetic calcium silicate trademarked "Micro-Cel Grade 1-A" is preferred. (to C. G. La Crosse.)

2,833,660—An improved wall plaster comprises calcined **gypsum** plaster, **lime,** boric acid and rice flour, with or without an inert aggregate. Boric acid serves to retard set and, in addition, prevents plaster from peeling off as it is applied with a trowel. Inclusion of the starch enables use of larger proportions of gypsum plaster in the mix. (to V. G. Busatti. By Josephine Busatti, administratrix.)

END

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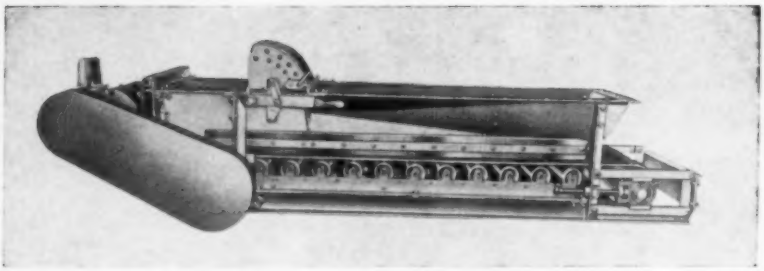
NEW MACHINERY



Belt feeder is designed as a packaged unit

OFFERING A CAPACITY RANGE from 5 to 550 tph., a newly announced belt feeder has been designed as a pre-engineered, packaged unit. Model F-8 is shipped assembled and ready for installation in a reclaiming tunnel, in a track or truck dump hopper, beneath elevated bins or in either a steel or wooden bulkhead.

Two drive arrangements are available. Through the medium of a gearmotor and a roller chain drive, constant belt speed may be attained, with capacity controlled by a quadrant-type control gate equipped with a fine screw adjustment. Variable belt speed is optional. It may be obtained through a variable speed reducer and roller chain arrangement, working in conjunction with a quick-adjusting quadrant gate having control settings in 1-in. increments. Idlers are closely spaced to prevent spillage from impact, and rubber flashing further minimizes this possibility. *Barber-Greene Co., 400 N. Highland Ave., Aurora, Ill.*

Enter 200 on Reader Card

Self-propelled compressor has gas or diesel power

A NEW SELF-PROPELLED air compressor in the 250 cfm. class is known as the Model 250 standard Pneumatractor and is available with either gas or diesel power.

The new model furnishes 250 cfm of air at 100 psi. to operate more tools more efficiently. It will operate three heavy rock drills, or six paving breakers, large drifter, wagon drill or self-contained, mounted-on drifter. The Model 250 Pneumatractor can be furnished with a front-end winch for added moving power or pulling, a rotary brush for cleaning operations or a snow plow blade.

The self-mobility of the unit eliminates the use of expensive manpower to move the machine. It moves to, from and on the job under its own power. The capacity of the compressor enables it to meet many requirements where a 210 cfm. machine is insufficient and a 315 cfm. is not needed. *Schramm, Inc., 900 E. Virginia Ave., West Chester, Pa.*

Enter 201 on Reader Card

Pneumatic drill

THE HAMMERDRIL, a new concept in drilling using the pneumatic principle, has been introduced. Produced in both low and high-pressure models the new drill has the ability to make fast hole at low cost regardless of the hard formations. This capacity results from use of an extra heavy hammer for maximum striking force and all the air does useful work. Depending upon air pressure and model, the tool can be adjusted to operate from 500 to 6,000 strokes a minute.

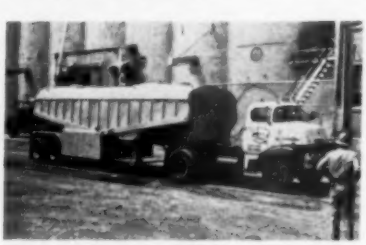
Simplicity is embodied in the fact that there are only three moving parts in the low pressure unit and only two moving parts in the high pressure model. Either can be used on any standard rotary rig with suitable air compressor capacity. An outstanding component of the bottom-hole impact tool is the bit which features six massive tungsten carbide inserts.

The low pressure Hammerdril is in the 100 lb. psi. range while the high pressure model is for 250 lb. psi. and above. Units in both pressure ranges are available in sizes of 3⅞ in. and 5¼-in. od., from 100 to 400 cfm.

The hole made by the drill is kept clean by a steady and powerful flow of air which is exhausted at the cutting area of the bit. The tool can be pulled off bottom to blow additional air to keep the hole clean. *Mission Mfg. Co., Houston, Texas.*

Enter 202 on Reader Card

Pump discharges cement from semi-trailer



A NEW DESIGN 35-ft. Air-Slide semi-trailer has demonstrated its capability to throw 120 bbl. of cement 147 ft. (10 story building height) in less than an hour. The unit is said to be the first of its kind ever produced.

The product hauled in the trailer is discharged into the Air-Slide pump at the center. It is operated by a 36 hp. air-cooled engine, which also provides power for compounded blowers. The pump is governed by pressure inside the pump body. When pressure drops (unloading) solenoid switches open twin hydraulic valves, allowing additional material to drop into the pump. Valves are closed by the same means (when full). Air volume is automatically increased and the commodity is blown through the discharge hose to the receiving facility.

The trailer has a capacity of 800 cu. ft. with overall height of 10 ft. 3 in., and will handle an 18-ton load. *Fruehauf Trailer Co., Detroit 32, Mich.*

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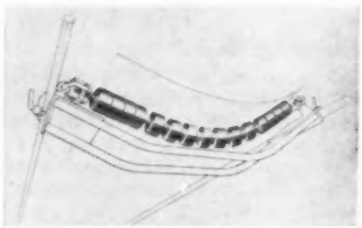


Belt conveyor

A NEW TWIST IN BULK MATERIALS handling is used in Limberope belt conveyors to lower initial cost and increase versatility. By suspending flexible Limberoller idlers between parallel stringers of steel wire rope, rigid support framing is eliminated.

Resulting advantages, according to the manufacturer, are lower costs; quick, simple installation and reduced maintenance. The whole system has fewer parts than ordinary belt conveyors, and is much lighter. It is easy to relocate or extend belt conveyors.

Resilient and flexible, the idler is said to improve belt life through absorption of load shock and more efficient support. Cushioned ride eliminates spillage and generally improves load handling. *Joy Mfg. Co., Oliver Bldg., Pittsburgh 22, Pa.*

Enter 232 on Reader Card

Flocculant improvement

PRODUCTION OF AN IMPROVED polyacrylamide-type flocculant known as Separan NP10 has been announced. A refinement of Separan 2610, its operational characteristics are the same. All Separan 2610 production has been converted to Separan NP10. Included among product improvements are higher purity, increased solution clarity and greater product uniformity. The new material is now available in commercial quantities.

Separan NP10 is used as a flocculant in filtering, thickening and clarification processes.

A synthetic, organic, water-soluble polymer, Separan NP10 has uniform effectiveness over a wide pH range. Manufactured as a white amorphous flake, the flocculant is dissolved in a dilute aqueous solution and fed into the effluent to be treated. *The Dow Chemical Co., Midland, Mich.*

Enter 233 on Reader Card

New bucket design gives less stress

A NEW SLACKLINE CABLEWAY bucket design permits the bucket to be made lighter in weight for a given strength and requires less line pull than other buckets of the same rated capacity.

Designated the Slackliner, the bucket has a continuously curved cutting edge designed to quickly penetrate hard-digging material and move it into the bucket with minimum resistance. This curve also gives more tension in the cutting edge with less bending stress.

The bucket is a completely welded assembly, with rolled high-strength steel plates throughout and integral tooth bases. The new buckets, now successfully operating in the field, are handling more material with less maintenance and with a reduction in power costs. Sizes available are 1, 1½ and 2 cu. yd. *Sauerman Bros., Inc., 630 S. 28th Ave., Bellwood, Ill.*

Enter 234 on Reader Card

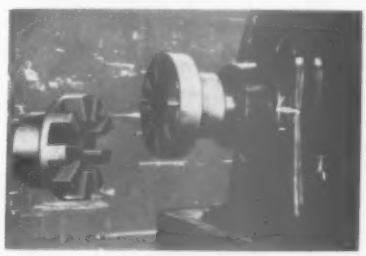
Ripping tool

A HEAVY-DUTY RIPPING DEVICE for tough rock strata has been announced. One of the features of this tool is its breaker plate, a heat-treated steel wedge 22 in. wide, weighing approximately 140 lb. and attached to the rear of the shank in a horizontal position. This breaker plate works on the same principle as a log-splitting wedge; it greatly expands the fractures in the stratum to the right and left of the shank and in front of the ripper point, while lifting ripped material upward.

The breaker plate's riding angle is controlled by an adjustable shoe mounted on the bottom of the breaker plate. Adjustment is made by a standard bolt and nut. The tool, 950 lb. of heat-treated billet steel, operates from the tractor ripper bar. *Double J Breaker Co., Inc., 3484 E. Gage Ave., Bell, California.*

Enter 235 on Reader Card

Flexible couplings



A COMPLETE LINE of flexible couplings, now being offered in sizes to 4,250 hp. and over, features quick installation and easy alignment. According to the manufacturer, connection to driving and driven shafts can be made in minutes. Alignment reportedly can be accomplished with a straightedge. Gauges are not required.

Bore sizes range to 9½ in. Bodies and jaws are machined electric steel or nodular cast iron. The load is entirely transmitted through compression of individual load cushions. This eliminates wear on the metal jaws and permits reversal or advancing of cushions on non-reversing loads to double cushion life.

The couplings do not require lubrication. All parts are visible for spot inspection, including cushions. The latter can be removed at any time without disturbing driving or driven units. *Lovejoy Flexible Coupling Co., 4938 W. Lake St., Chicago 44, Ill.*

Enter 236 on Reader Card

(Continued on following page)

NEW MACHINERY

(Continued from page 179)

Screw pump

AN ADAPTATION OF THE Archimedean lift pump of antiquity is the Goodyear Pump, which borrows the "screw" of the Archimedes pump, and, according to the manufacturer, revolutionizes this famous principle by the addition of one simple part. Three sizes of the pump (1¼, 1½ and 2½-in. suction and delivery connections) requiring prime movers of from ⅓ to 16 bhp. cover a range of outputs from 4½ to 167 gpm. against heads of from 50 to 200 ft. The 1½-in. pump, weighing 11 lb. and sized 8 x 4 x 9 in., can deliver (at 3,000 rpm.) 31 gpm. against a 200-ft. head and requires a prime mover of only 3.1 bhp. This single-stage pumping is carried out at 61 percent efficiency.

The unit is a continuous, self-priming and self-lubricating pump. It is a positive axial-flow unit employing a screw (rotor) of entirely new form. This screw engages with a rotating plate to produce a pulseless action that is virtually positive. The rotor and plate wheel are the only moving parts, and since the rotor spins on its own true centers there is no tendency to roll around and rub against the surrounding rubber stator. *Goodyear Pumps Ltd., Camborne, Cornwall, England.*

Enter 204 on Reader Card

Drill chassis

AN AIR-POWERED, self-propelled TDM "Trac-Drill" has been introduced to carry the Joy TM-450 drill. The machine is capable of drilling 3½-in.-diam. blastholes to a depth of 40 ft. or more. Completely power-operated, the new drill chassis offers a wide range of drilling positions.

Two six-cylinder radial air motors combine to provide a total of 23 hp. for a tramming speed of 117 fpm. and make the unit powerful enough to tow a 900-cfm. rotary compressor up a 10-percent grade, the manufacturer claims. A clutch arrangement built into the transmission of each air motor permits free-wheeling towing when necessary. There is also a brake on each drive motor.

The unit is available with feeds for handling 10-ft. coupled steels. It can also be equipped with an air-powered winch for handling and uncoupling drill steel. *Joy Mfg. Co., Oliver Building, Pittsburgh 22, Pa.*

Enter 205 on Reader Card

Aluminum bucket

ALUMINUM HAS BEEN introduced into the construction of 3 to 10-cu. yd. power crane clamshell buckets for the handling of free-flowing materials, reducing weight of the buckets and increasing the payload. Tandem positioning of the lower closing sheaves permits the closing line lead to function in the center plane of the bucket. This eliminates bending of the cable at the guide rollers as the bucket is hoisted and permits the bucket to hang plumb from the crane boom, reducing cable wear. Cutting edges, corners and other surfaces exposed to rough treatment are made of steel. *The Owen Bucket Co., 6001 Breakwater Ave., Cleveland 2, Ohio.*

Enter 206 on Reader Card

Welded steel pulleys

WELDED STEEL PULLEYS featuring "Taper-Lock" hubs are said to give the equivalent of a shrunk-on fit on the shafting while permitting easy assembly and disassembly. Welded steel construction provides maximum strength combined with economy of weight. Crown or straight-faced pulleys can be furnished. *Industrial Division, Continental Gin Co., Birmingham 2, Ala.*

Enter 207 on Reader Card

Vibrating feeder

FOR CONTROLLED FEEDING of a wide range of bulk materials at high rates, a straightline vibrating feeder has been announced. Capable of absorbing great impacts, the new unit can be mounted directly under a hopper or bin to feed, convey, pick or scalp high tonnages of materials, including lumps up to 36 in. diam. A geared eccentric shaft mechanism produces a high-intensity straightline stroke that ranges in amplitude from ¼ to ½ in. up to 900 rpm.

Available in a wide range of dimensions to suit many types of installation purposes, the new feeder can be floor supported or suspended by cables from bins, tanks or hoppers. It can also be equipped with special features such as dust-tight covers and scalping decks. As an aid to lengthening conveyor belt life, the new feeder can also be equipped with a short grizzly section that will permit fines to fall onto the belt and cushion the fall of heavy lumps. *Link-Belt Co., Prudential Plaza, Chicago 1, Ill.*

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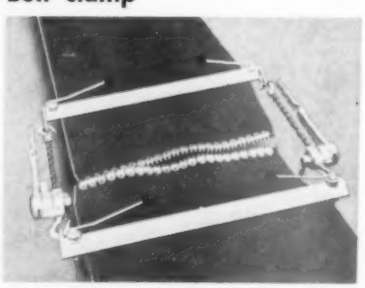
Belt clamp



A HEAVY-DUTY BELT CLAMP designed for long, high-tension conveyor belt installations has been introduced. LS-3 is an addition to the present line of "Far-Pul" belt clamps and is recommended for belts 30 to 36 in. wide. The new clamp is of all-steel construction and consists of two pairs of clamping bars, one pair for each belt end. Each pair of bars is made up of three parts: V-bar (angle iron), round "gripping" bar and draw-up bolt. *Flexible Steel Lacing Co., 4684 Lexington St., Chicago 44, Ill.*

Enter 209 on Reader Card

Screen-cloth mounter

A NEW DEVICE FOR MOUNTING and tensioning screen cloth on vibrating screens has been announced. The device, consisting of a special slotted bolt and wedge, with retaining washer and swivel washer, makes it possible to change cloth in about one-half the time required with conventional threaded bolts and locknuts, the manufacturer claims.

A screen cloth unit is released by a few hammer blows on the wedge, and the replacement unit is securely and uniformly tensioned at all points by a few more blows.

The wedges and bolts are made of forged alloy steel heat treated to a Brinnell hardness range of 350 to 400. They are constructed to withstand rough treatment and give long service. *Hewitt-Robins, Inc., Stamford, Conn.*

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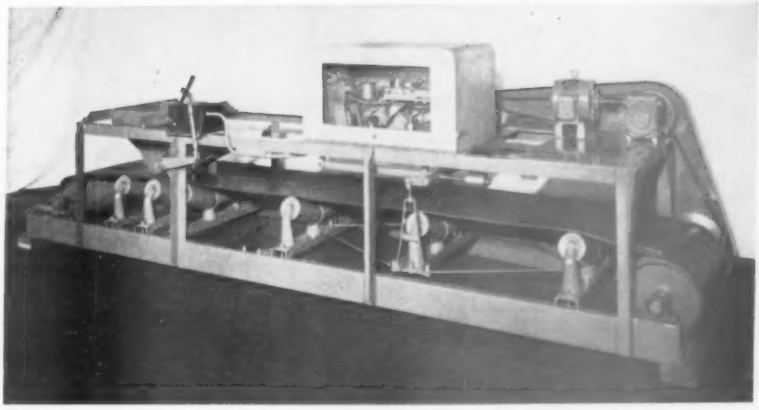

Continuous weighing provided by belt scale feeder

THIS AUTOMATIC, FEED REGULATING, continuous weighing scale is designed to blend and control the flow of bulk materials. It is said to maintain feed accuracy to within one percent of a preset rate. Shipped as a complete package installation, the unit consists of a powered conveyor section mounted on a jig welded structural steel frame, belting, idle and power rollers and continuous totalizing scale.

Feeder operation is controlled by limit switches mounted in the scale housing. These are readily set to maintain any desired rate of flow. Capacity of any ABCs belt scale feeder installation is limited by that of the conveyor line itself. *ABCs Scale Division, McDowell Co., Inc., 16300 Waterloo Rd., Cleveland 10, Ohio.*

Enter 220 on Reader Card

Crawler-mounted crane

CAPACITY TO LIFT 90,000 lb. with a 40-ft. boom, 11,000 lb. more than its own working weight, is one of the features claimed by the manufacturer of a new crawler-mounted crane. Pivoting outriggers, used when making heavy lifts, are quickly swung into position and pedestals attached. When the crawlers are moving, the outriggers can be folded back to an out-of-the-way position or removed completely. The new crane, designated the 545 "Sprawler," can "walk" with 61,500 lb. when the outriggers are not used, according to the manufacturer.

By stripping the "Sprawler" for transportation, it is possible to reduce the shipping weight from 79,000 lb. to 47,500 lb. The crane's counterweight is power-removed with A-frame for transporting.

With the A-frame in a lowered position, the crane can be moved through low clearance structures. Highest point with boom lowered is 16 ft. ¼ in. This clearance point can be reduced to 11½ ft. when boom and A-frame are removed. Pendant-type boom suspension simplifies the changing of boom lengths.

Overall length of standard crawlers is 14¼ ft. Equipped with 30-in. shoes, overall width of crawlers is 11 ft. 2 in. This is increased to 11 ft. 8 in. when 36-in. shoes are used. *Koehring Division, Milwaukee 16, Wis.*

Enter 217 on Reader Card

Tractor attachments

ALLIS-CHALMERS HAS CLEARED for mounting to its Model D-14 tractor two new units, the Mark II backhoe and the L-600 utility loader.

The backhoe digs to a depth of 12½ ft., has a loading height of 8½ ft., a 200-deg. arc of swing and a reach from center line of rear axle of 18 ft. 8 in. The backhoe may be removed in a matter of minutes to free the tractor for other work.

Features of the utility loader are its light weight and lower operating pressure of 1,250 psi. In addition, the loader has a dump height at maximum dump of 104 ft., a lifting capacity to full height of 1,500 lb., a breakaway capacity of 3,000 lb. and a digging depth below grade of 4 in. Overall height of the loader is 61½ in. *Henry Mfg. Co., Inc., Box 521, Topeka, Kan.*

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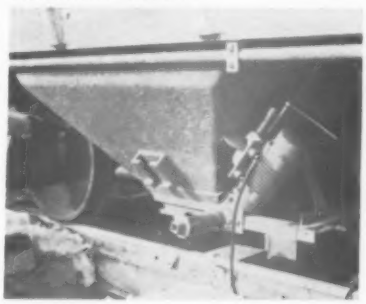
Electric vibrator



AN ELECTRIC VIBRATOR designed to speed the unloading of dry cement, sand and other types of powdered or granular materials has been introduced. The unit utilizes the rotary eccentric. "Vibramat" can be attached to the unloading hopper of railroad freight cars or other transporting equipment. It sets up a concentrated vibration alleviating the need for sledge-hammer pounding to loosen jammed or packed materials.

The vibrator is available with rigid or swinging base and with ⅛, ⅓ or 1-hp. motor. Rigid base models are used wherever vibration in all directions is desired. Swinging-base models are used on vibrating tables and other applications where a concentrated reciprocal vibration is desired. *Engineered Equipment, Inc., Waterloo, Iowa.*

Enter 219 on Reader Card

(Continued on page 184)

GIFFORD-HILL CO., INC., operates three General Electric locomotives at their Irving, Texas, SW Construction Materials Div. Plant No. 1. The 45-tonner above has been in operation since 1953 hauling heavy loads and saving money for the customer.

THE GRANITE ROCK COMPANY in Aromas, Calif., moves up to 6,000 tons of rock a day with their powerful G-E 65-ton loco-

PUTTING PLANT TRACKS TO WORK . . .

General Electric Locomotives Help Move 13,500 Tons of Crushed Rock a Day For Three Rock Products Companies

motive installed in 1951. Unit operates more than 2000 hours a year . . . has required no major maintenance.

SERVTEX MATERIALS COMPANY moves approximately 100 railroad cars a day at their New Braunfels, Texas, quarry and rock crushing plant. They have sharp curves and grades up to 3 percent. Servtex finds that their G-E 65-tonner can stand the pace.

The operations carried on by the three rock products companies pictured above have two things in common: getting rock in for processing . . . getting finished material out and on its way to customers. These three companies rely on General Electric industrial locomotives for these vital operations. They agree that:

G-E LOCOMOTIVES SAVE MONEY because they require little maintenance, use low-cost fuel, have no complicated, expensive-to-repair gears and transmissions, and are available up to 95 percent of the time for just about the most rugged duty ever demanded of any materials handling vehicle.

G-E LOCOMOTIVES ARE FAST AND EFFICIENT. A press of the starter button puts a G-E diesel electric on the job. High tractive effort—just the kind of power needed for handling heavy material—is readily available. Locomotives are doubly efficient because they let these companies put their existing tracks to more profitable work.

G-E LOCOMOTIVES GIVE LONG LIFE because General Electric industrial haulage specialists work with you to select the right locomotive to meet your haulage requirements. Complete parts and parts service is as close to you as your nearest G-E Apparatus Sales Office.

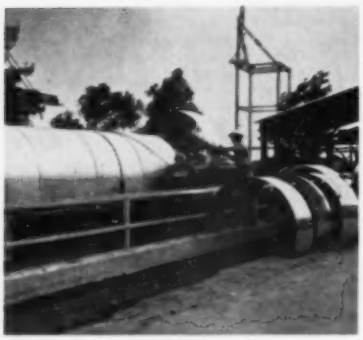
IF YOU NOW HAVE TRACK OR IF YOU ARE CONSIDERING A NEW PLANT SITE, ASK FOR A FREE SURVEY THAT WILL SHOW HOW YOU COULD SAVE WITH A GENERAL ELECTRIC LOCOMOTIVE. For a free survey now of your haulage needs, call your nearest General Electric Apparatus Sales Office. It's listed in the white pages of your telephone directory. General Electric Co., Locomotive & Car Equipment Dept., Erie, Pa. 120-100

Progress Is Our Most Important Product

GENERAL ELECTRIC

NEW MACHINERY

(Continued from page 181)



Conveyor covers

ALUMINUM CONVEYOR COVERS are said to be less expensive to install, permit substantial reductions in maintenance cost and have an economical advantage that points to widespread use of the material on belt lines of all types.

The sections are U-shaped with vertical sides and a center of curvature 1½ ft. above the belt line. Stainless steel, hex-headed screws are used to attach the sections to the conveyor frame. A weather-tight seal is obtained by caulking side laps with a ½-in. bead of aluminum pigmented mastic and using ¾-in. self-tapping screws 12 to 24 in. on centers as lap fasteners. *Kaiser Aluminum & Chemical Corp., 1924 Broadway, Oakland 12, Calif.*

Enter 210 on Reader Card

Bin vibrators

JUST ANNOUNCED is a new series of bin vibrators especially designed for "pin-point" installation on bins, hoppers and chutes. Where materials being handled show a tendency to pack or bridge, the trouble is readily overcome by applying one of these units at the precise point of difficulty, where its vibratory action insures a continuous flow of material.

Requiring no rectifier, and working directly from either 50 cycle ac. or 60 cycle ac. with no change in any component, the new vibrators are characterized by almost noiseless operation. The primary vibration-producing element within the housing is a cast brass armature in which are permanently embedded powerful Alnico V magnets and soft iron poles.

When used in conjunction with a control box, a vibrator powerful enough to handle the heaviest anticipated loads can be installed, and the amplitude of vibration reduced as much as desired to handle ordinary loads. *Eriez Mfg. Co., Erie 6, Pa.*

Enter 211 on Reader Card

Dual-purpose compactor

BALLAST CAN BE LIGHTENED or completely emptied in seconds in a new model of the "Duo-Pactor." A dump-type ballast box, which eliminates need for removal of ballast by clamshell or hand shoveling, also allows the unit to serve as an 8 to 12-cu. yd. off-highway hauler.

The new unit will carry 32,000 to 40,000 lb. of ballast or payload, compared with weight of 18,000 lb. when empty, according to the manufacturer. A hydraulic lift raises the body for dumping. *Seaman - Gunnison Corp., 2763 S. 27th St., Milwaukee 15, Wis.*

Enter 212 on Reader Card

Vibrating screen

NEWEST ADDITION to Allis-Chalmers' run-of-mine vibrating screens is this 8 x 14-ft. double-deck, floor-mounted unit (Model XXH). The screen is equipped with cartridge-type mechanism for quick and easy removal. This particular unit is handling 7-in. crushed limestone and making 5½ and 3-in. separations with peak loads up to 1,760 tph. *Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.*

Enter 215 on Reader Card

Underbody hoist

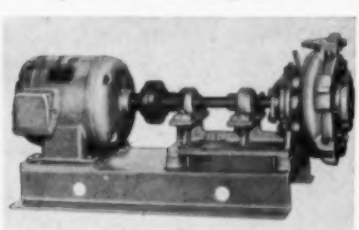
AN UNDERBODY HOIST for use under very large and heavy dump bodies has been introduced. Called the HD-88, the unit is a twin-cylinder, double-arm type hoist with a Class 14 HAB-MA rating. Its capacity rating is 25 to 30 tons.

This hoist features a specially designed arm system. The lift arm assembly is an integral steel plate weldment of massive proportions, designed to give moderate and well-regulated oil pressures. According to the manufacturer, solid construction of the arm structure protects the hoist frame and cylinders from twisting stress while the body is being raised. There is no crosshead in the lift arm assembly. The piston rods have solid steel knuckles which attach them to the arm structure.

The sub-frame is constructed as an integral unit. The point of support at the base of the cylinder will withstand extreme horizontal and vertical stresses. *Marion Metal Products Co., Marion, Ohio.*

Enter 214 on Reader Card

Pump series designed for abusive applications



A NEW LINE OF PUMPS, designated the "K" series, is designed exclusively for abusive applications, such as those involving abrasion, corrosion or handling of hot liquids. The pumps are said to be especially desirable for the latter because of the exposed shaft design. Pumps can be stationed either above or below sump liquid level.

These are single stage, end-suction pumps, made in sizes from 1 to 10 in. for heads up to 250 ft. or more and for capacities in the range of 4,000 gpm. The pumps are available in three basic designs: Type KR, illustrated, for limited heads; type KC, for corrosive or mildly abrasive applications; and type KE, for high-pressure abrasive or corrosive applications. Housings or water ends are available in a variety of metals or alloys. *Nagle Pumps, Inc., 1269 Center Ave., Chicago Heights, Ill.*

Enter 213 on Reader Card

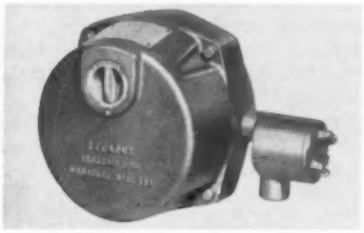
Belt conveyor scales

FOR WEIGHING, controlling and totalizing free-flowing bulk materials, a redesigned line of belt conveyor scales is available. Utilizing mechanical linkages in both weight measuring and registering systems to minimize and simplify maintenance, the belt scales are built to an accuracy of one-half to one percent of flow over their entire weight range. Units are available for any belt width and capacity.

The scale housing is fabricated from dust-sealed aluminum, with neoprene sponge seals. A full-opening door with three-quarter size window improves visibility and permits easy access for setting, routine checking and maintenance. *ABCs Scale Division, McDowell Co., Inc., 16300 Waterloo Rd., Cleveland 10, Ohio.*

Enter 237 on Reader Card

Electromagnetic disc brake



AN AC. BRAKE with Underwriters Laboratories approval for both Class 1, Group D and Class 2, Groups E, F and G, has been designed for mounting on the NEMA "C" mounting flange of fractional-hp. electric motor frames 56-C and 66-C, integral motor frames 182 and 184. Any ac. voltage 110 through 550, 25, 50, or 60 cycles, including dual voltages, is available in the series.

In addition to the dual Underwriters approval, this unit is said to offer "unitized" construction of the operating mechanism, simplicity of design, single solenoid, external manual release-automatic reset and visual indication of the necessity for adjustment for lining wear. *Stearns Electric Corp., 120 N. Broadway, Milwaukee 2, Wis.*

Enter 238 on Reader Card

Lightweight couplings

FLEXIBLE DRIVE COUPLINGS being marketed under the trade name Magnaloy are made of a magnesium alloy that provides the strength of steel with an 80-percent reduction in weight.

These couplings are not pressed on, but are slipped over the shafts. They are made tight through the use of separate split hubs, which fit into the coupling halves much like a tapered tool shank in a holder. Socket-head screws are used to draw the two together and this compresses the spit hub around the shaft.

The drive is transmitted through a lugged neoprene drive insert, providing an insulated, non-lubricated connection, absorbing misalignment and shock. Made in eight sizes, they will accept from ¾ to 6-in. shafts. *Detroit Power Coupling Co., 992 W. Seven Mile Rd., Detroit 3, Mich.*

Enter 239 on Reader Card

Diesel tractors

A NEW LINE of diesel tractors is now being marketed. The first Ford diesel engine has a displacement of 172 cu. in., delivering 35 hp. at the drawbar. Available in two series of tractors, including four models of utility and all-purpose types, the engine has a 16:1 compression ratio and a direct fuel injection system.

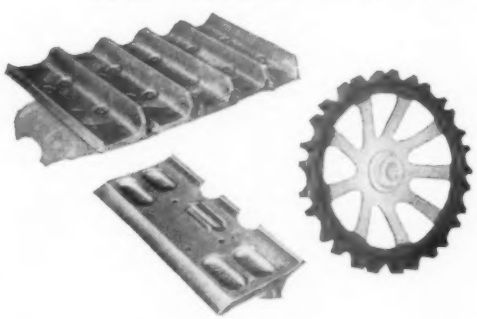
Normal starting is provided by a 12-v. electrical starter. Under extreme cold weather conditions, optional manifold preheaters or an ether cell may be used as a starting aid.

Although the Ford diesel and gasoline engines are similar in size and appearance, the diesel is equipped with larger air intake, air cleaning and exhaust systems. The overhead valve type cylinder head has been designed to accommodate the fuel, air and pressure requirements of the diesel. To adapt the "Red Tiger" engine to diesel use, heavier pistons equipped with five rings, forged steel crankshaft, new connecting rods, and other special parts were designed. *Tractor and Implement Division, Ford Motor Co., Birmingham, Mich.*

Enter 240 on Reader Card

(Continued on following page)

NU-LIFE for your old tractor with increased productivity



Operators of Crawler Tractors, here is your opportunity to put new life in that old machine, and at the same time increase its production efficiency. KENSINGTON engineers and metallurgists have developed new heavy duty Grouser Plates and Weld-On Sprocket Rims that are made to fit all standard Crawler Tractors.

CAST TO OUTLAST THEM ALL

KENSINGTON wear resistant replacement parts are cast of specially alloyed manganese steels that include certain distinctive features that are not found in other metals. These steels have the unique capacity of rapidly producing an unusual degree of surface hardness, when exposed to impact and shock under normal operating conditions. This work-hardening skin automatically develops in those areas where the wearing factor is most intense.

PRACTICAL DESIGN IMPROVEMENTS

KENSINGTON engineers in developing these Grouser Plates and Weld-On Sprocket Rims, have incorporated many important design changes that have greatly contributed to the success that they have attained in longer serviceable life, less down time, more efficient operation and lower costs.

Don't hesitate—the information that this coupon will bring is worth many dollars to you. Clip out and return—there is no obligation.

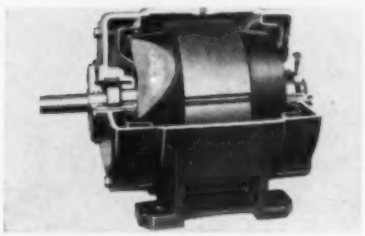
Kensington STEEL

KENSINGTON STEEL
Dept. R, 505 E. Kensington Ave., Chicago 28, Ill.
• Please send information on grouser plates and weld-on sprocket rims for tractor described below. I understand I will be under no obligation.
Make of tractor_____ Model_____
No. tracks per belt_____ Width of grouser_____
NAME_____
COMPANY_____
ADDRESS_____
CITY_____ ZONE_____ STATE_____

Enter 1275 on Reader Card

NEW MACHINERY

(Continued from preceding page)



Encapsulated motors

BY COMPLETELY CASTING open-type motor stators in an epoxy resin, an addition to the Super-Seal line of motors features complete protection for the insulation system.

Motor applications include the most severe conditions of outdoor service. More specifically, encapsulated motor insulation can be used where moisture or contaminated atmospheres could destroy the effectiveness of conventional insulation systems, previously requiring special enclosures. The epoxy system can be used at a considerable savings in initial motor investment.

The winding end turns are completely enclosed in a hard, protective case, making them impervious to moisture and resistant to attack by solvents, oils and the most commonly encountered chemicals. The epoxy resin also flows through the slot portions giving them the same protection.

Super-Seal epoxy resin encapsulation will be available in all integral horsepower frame sizes. *Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.*

Enter 254 on Reader Card

Mobile drill

A MOBILE DRILL designed for augering, core drilling and large-diameter earth boring has been introduced. Called the B-40 Explorer, this unit is used for continuous flight augering to 75 ft., coring to 500 ft. and for boring holes up to 24 in. diam.

The unit is self-powered by a 4-cyl., 36-hp. air-cooled engine. It is also available without engine for mounting on any power takeoff-equipped truck, barge or tractor. Compact size permits installation on half-ton carriers.

The pto. model weighs only 1,400 lb. To increase mobility, both tower and drill frame lower to horizontal position (shaded section of illustration.) This permits drilling at any angle from vertical to horizontal.

Hydraulic drive delivers high torque to assure positive augering action. Drilling speed ranges from 62 to 500 rpm. with maximum torque output of 1,740 ft.-lb. The 68-in. stroke is actuated by a hydraulic cylinder exerting 7,069 lb. lift pressure and 6,283 lb. ram pressure. Rate of free feed is 35.3 fpm. Centralized controls permit one-man operation. *Mobile Drilling, Inc., Dept. 31, 960 N. Pennsylvania St., Indianapolis, Ind .*

Enter 255 on Reader Card

Tractor loader

A LOADER WITH a 2¼-cu. yd. bucket capacity has been announced. Called the OC-156, it is rigidly mounted so that the loads are taken directly on the subframe. The new, low-profile design provides full visibility and low center of gravity for quicker, fuller loading.

Length of track on the ground is 87⅛ in., with 2,788 sq. in. contact area to give greater stability for fast and heavy loading. The hydraulic pump is located under the radiator and is engine-mounted. Full-length steel guards protect the six lower track wheels. *The Oliver Corp., Industrial Division, 19300 Euclid Ave., Cleveland 17, Ohio.*

Enter 256 on Reader Card

(Continued on page 188)

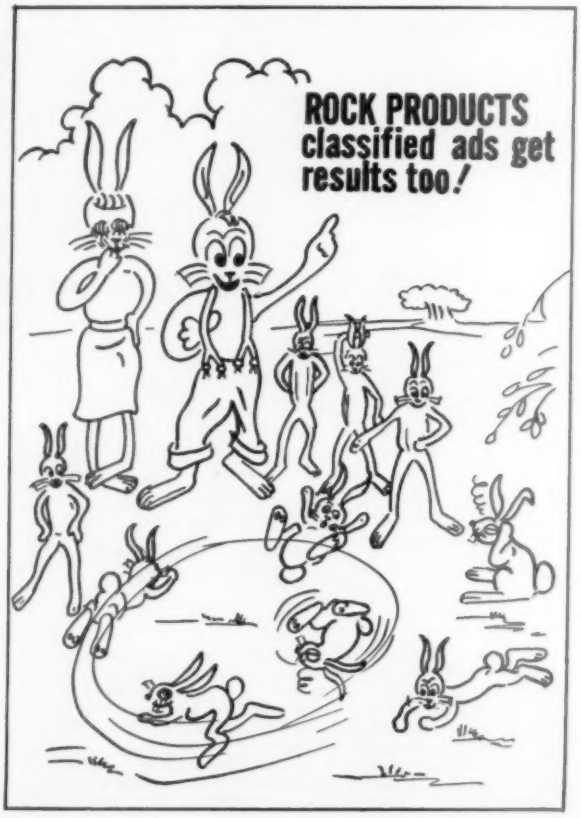
Starting a cold engine without SPRAY STARTING FLUID is costly. Constant wear of the starting system . . . wasted man hours . . . equipment down-time . . . repeated engine strain, can be prevented with a pressurized can of SPRAY STARTING FLUID. It's so easy to use! Apply SPRAY STARTING FLUID into the air cleaner or intake air stream while cranking the engine. Continue spraying until the engine runs smoothly. Use SPRAY STARTING FLUID regularly for quick, easy and economical starting of diesel and gasoline engines. Start every work day with SPRAY!

*Until the engine reaches normal operating temperature it is a cold engine.

SPRAY PRODUCTS CORPORATION

P. O. Box 844 • Camden 1, New Jersey

Enter 1345 on Reader Card



SINCE 1885 — GRUENDLER QUALITY, THE BEST THAT MONEY CAN BUY

Gruendler Heavy Duty Large Capacity Hammermills

Large tonnage producers!—Unexcelled for secondary crushing and fine reduction of materials. Steps up capacities of Ball or Compeb Mills.

Illustration No. 1
6XD Hammermill
(250 T.P.H. Capacity)

Illustration No. 2
6XC Hammermill Installation (150 T.P.H. Capacity)

Our powerful 6X Series Hammermills are constructed of cast steel alloy for long life. Equipped with tramp metal catcher and lubrication system. Manganese breaker plates and grate bars are adjustable. Complete range of sizes. View of a large Hammermill installation at Dewey Portland Cement Company, Davenport, Iowa (illustration No. 2) in operation for over 20 years and still holding its own on around the clock service.

GRUENDLER HAMMERMILLS are backed by over 70 years experience. Write for Bulletin.

GRUENDLER CRUSHER & PULVERIZER CO.

Dept. R.P.-958 2915 N. Market St., St. Louis 6, Mo.

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RP BUYER RESEARCH SERVICE

PRODUCER PURCHASING SERVICE *FREE*

QUICK—COMPLETE SOURCE CONTACTS FOR ROCK PRODUCTS PRODUCERS on Machinery—Equipment—Supplies—Service

___Aftercoolers, Air
___Agitators
___Aggregates (special)
___Air Compressors
___Asphalt Mixing Plants
___Bagging Machines
___Bags
___Barges
___Belting, Conveyer
___Elevator, Power Transmission
___Belting, V-type
___Belt Repair Equipment
___Bin Level Indicators
___Bins and Batching Equipment
___Bits
___Blasting Supplies
___Bodies, Trailer
___Buckets
___Bulldozers
___Cars, Industrial
___Classifiers
___Clutches
___Coal Pulverizing Equipment
___Concentrating Tables
___Conveyors
___Crushers
___Coolers
___Cranes
___Derricks
___Dewatering Equipment, Sand
___Diesel Engines
___Dragline Cableway Excavators
___Draglines
___Dredge Pumps
___Drilling Accessories
___Drills
___Dryers
___Dump Bodies
___Dust Collecting Equipment & Supplies
___Electric Motors
___Engineering Service Consulting and Designing
___Explosives & Dynamite
___Fans and Blowers
___Feeders
___Fifth Wheel Heavy Duty Special
___Flotation Equipment
___Front End Loaders
___Gasoline Engines
___Gear Reducers
___Generator Sets
___Grinding Media
___Gypsum Plant Machinery
___Hard Surfacing Materials
___Hoists
___Hoppers
___Kilns: Rotary, Shaft, Vertical
___Locomotives
___Lubricants
___Magnetic Separators
___Mills
___Pipe
___Pumps
___Scales
___Screen Cloth
___Screens
___Scrubbers: Crushed Stone, Gravel
___Shovels, Power
___Speed Reducers
___Tanks, Storage
___Tires and Tubes
___Torque Convertors
___Tractor Shovels
___Tractors
___Trailer Dump Bodies
___Trucks, Bulk Cement
___Trucks, Industrial
___Trucks, Mixer Body
___Trucks, Motor
___Valves
___Vibrators
___Welding and Cutting Equipment
___Winches
___Wire Cloth
___Wire Rope

If equipment you are in market for is not listed above, write it in space below.

The principal rock product(s) manufactured by my company is/are indicated "1", "2", "3", in order of importance below.

___Crushed Stone
___Sand & Gravel
___Slag
___Cement
___Lime
___Gypsum
___Ready Mix Concrete
___Concrete Products Type_____
Other nonmetallic mineral (What?)_____

All above information is strictly confidential to be used to guide the manufacturers in supplying proper information.

Please Check Service Desired

☐ Have Salesman Call ☐ Literature only
☐ Prices ☐ By mail ☐ Urgent

NOTE: See—Where to Buy-Classified Advertising Section for used equipment and complete plant information

Name_____
Title_____
Firm_____
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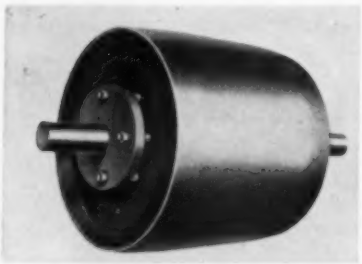
City and State_____
Your Signature_____ Title_____

FILL IN—TEAR OUT—MAIL NOW! *BUYER RESEARCH SERVICE DEPARTMENT:* ROCK PRODUCTS 79 W. Monroe St. Chicago 3, Illinois

NEW MACHINERY

(Continued from page 186)



Belt conveyor pulley

A NEW BELT CONVEYOR PULLEY, known as the Curve-Crown pulley incorporates new features of design and manufacture. The new pulley improves upon the features of the conventional taper crown and flat-face pulleys, and eliminates the disadvantages, according to the manufacturer.

The Curve-Crown pulley is produced under a completely new forming process. It is an absolutely round-rimmed pulley with a single seam, welded on both the outside and inside for maximum strength. The crown of the pulley is accurately formed providing maximum training effect but eliminating belt stretch and wear, usually prevalent with high-centered taper crown pulleys.

The newly designed pulley features a Squeeze-Lock hub which effectively transfers loads from shaft to hub and from hub to rim, eliminates weldments between hub and pulley end plates and provides sufficient locking forces on the shaft without the use of keyways. It is available for all shaft sizes. *Stephens-Adamson Mfg. Co., Ridgeway Ave., Aurora, Ill.*

Enter 257 on Reader Card

Tractor-drawn scraper

LETOURNEAU-WESTINGHOUSE CO. has announced the addition to its line of an 11½-cu. yd. scraper for use with tractors of 70 hp. or more. The unit, designated the DT "Fullpak" model, has a smooth bowl interior to minimize resistance in loading and unloading. The bowl floor, which provides approximately 28 sq. ft. of load base, the cutting blade to the tailgate.

The model's 8 ft. 4 in., three-section blade is angled with the floor of the bowl to reduce loading resistance. With a 1-deg. floor tilt, the scraper bottom remains nearly flat in the loading position. The rear wheels are set within blade width to provide for maximum controllability.

Overall length of the scraper is nearly 29 ft. and it requires less than 26 ft. of space to make a complete turn. *LeTourneau-Westinghouse Co., Peoria, Ill.*

Enter 258 on Reader Card

Pancake motor

A PANCAKE MOTOR WHICH REDUCES motor length up to 60 percent is designed for use on machine tools, roof-ventilating fans and many other space-cramped applications.

The pancake motor is a flange-type motor of conventional radial air-gap design. It achieves its short length through formed end coils and a one-piece housing-bearing bracket. For normal operating conditions it is built in an open drip-proof enclosure. Where dirt, filings, corrosive chemicals, coolants or other contaminants are present, it can be furnished enclosed.

The motor is available in ratings from 1 to 15 hp. at 1,800, 1,200 and 900 rpm. Additional features include: vertical or horizontal mounting, cast iron housing-bearing bracket, factory lubricated bearings and quiet operation. *The Louis Allis Co., Dept. P, 427 E. Stewart St., Milwaukee 1, Wis.*

Enter 259 on Reader Card

(Continued on page 190)

PRESS

TRIPLE TAPERED DUMP BODIES

Designed primarily for handling sand and gravel, this outstanding Press body features a 3 taper design which allows for greater load on the front end to take advantage of strict weight laws. Available with underbody or front mount hoist. Write today for literature on Press bodies.

99 YEARS OF QUALITY BODY BUILDING

JACOB PRESS' SONS, inc.

3312 S. Normal Ave., Chicago 16, Ill.

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CONTRACT CORE DRILLING

EXPLORATION FOR MINERAL DEPOSITS
INCLUDING URANIUM & LIMESTONE — ANYWHERE

FOUNDATION TEST BORING

GROUT HOLE DRILLING

Skilled crews and complete stock of core drills and accessory equipment maintained at all times

Core Drill Contractors for more than 60 years

JOY MANUFACTURING CO.
Contract Core Drill Division
MICHIGAN CITY, INDIANA

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ROCK PRODUCTS
THE
RECOGNIZED AUTHORITY
OF THE
NON-METALLIC
MINERALS INDUSTRY

THE Toughness Champ ... LIGHTER BUT TOUGHER

OUR CLUPAK* MULTIWALL

Pound for pound, our new multiwalls—made of Kraftsman Clupak paper—can take abuse that breaks ordinary bags. Clupak multiwalls are lighter—but much tougher. Even with fewer plies than ordinary multiwalls, these new bags still perform better—and *more economically!*

Kraftsman Clupak paper gives these new bags their extra toughness. This paper has a patented, built-in "stretch" that stands up against rough handling in transport, storage and use.

Best of all, even with these important advantages, our new Clupak multiwalls *cost no more* than old fashioned, regular bags.

West Virginia's Clupak multiwalls are available now in these types: Pasted Open Mouth, Pasted Valve, Sewn Valve, Sewn Open Mouth and Stepped End.

All of them are lighter and tougher. Try them ... on your next carload order, let us include a trial shipment of 5,000 of our Clupak multiwalls. Call or write:

MULTIWALL BAG DIVISION

WEST VIRGINIA PULP AND PAPER COMPANY

230 Park Avenue, New York 17, N. Y.

PLANTS: TORRANCE, CALIF. • ST. LOUIS, MO. • NEW ORLEANS, LA. • WELLSBURG, W. VA.

*Clupak, Inc.'s trademark for stretchable paper.

Enter 1356 on Reader Card

NEW MACHINERY

(Continued from page 188)

Conveyor belts

A LINE OF NYCORD rubber conveyor belts, made with cord plies and designed for general industrial use, has been announced.

According to the manufacturer, the new construction greatly increases edge protection, fastener holding ability and impact resistance and provides extra protection against damaging effects of acid, moisture and mildew. Each cord is completely insulated and imbedded in rubber. Water or acid entering through a cover cut cannot wick throughout the carcass to cause early failure, the manufacturer says.

Available in three constructions—Nycord 32, 36 and 42—the new belt is applicable to normal conveyor systems in sand and gravel operations, quarry, mine and general manufacturing plants. *The B. F. Goodrich Co., Akron, Ohio.*

Enter 260 on Reader Card

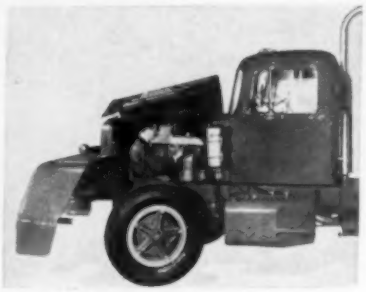
Diesel electric plant

A 3,000-W. AIR-COOLED diesel electric generating plant, Model DSL, has been announced. This electric plant features the "Vacu-Flo" cooling system, which employs a centrifugal blower that pulls cooling air through the generator and over the heated engine parts, then expels the heated air through a duct to the outside. This cooling feature enables the plant to be installed in completely enclosed compartments, in a space just slightly larger than the unit and its accessories, with allowances for an air intake and exhaust outlet.

Because of its compact size and unique cooling system, the new model is said to be highly suited for mobile and portable uses. A new steel turret hood permits all-weather operation and protects the plant against falling materials. *D. W. Onan & Sons, Inc., Minneapolis 14, Minn.*

Enter 261 on Reader Card

Heavy-duty trucks have new look



A PRACTICAL NEW STYLING and appearance has been used in the new "Huskie" models, producing a fresh new look in heavy-duty truck design. The new trucks have been engineered with the accent on accessibility for easy maintenance including swing-away fenders. This is a practical means of providing ready access to the engine for easy maintenance.

On the highway, the trucks can be easily recognized by new flat top fenders, supporting an aluminum tread plate and dual headlamps, and with sparkling new chrome identification in script on the hoods. Included in this new line is a complete range of diesels as well as an improved and perfected line of gasoline powered models. With this basic functional, flexible design, other types are available with a wide range of components matched and balanced to best fill each particular requirement. *Brockway Motor Trucks, Division of Mack Trucks Inc., Cortland, N.Y.*

Enter 262 on Reader Card END

"CROSS HEXCREEN"
A Honey of a Screen for MORE STRENGTH MORE CAPACITY and ENGINEERED PERFORMANCE
Look for this stamp on all "Cross" Products
THE SIGN OF PLUS QUALITY for PLUS PERFORMANCE
CROSS Perforated Steel Sections and Decks for VIBRATING — SHAKING — REVOLVING SCREENS
CROSS ENGINEERING COMPANY
Established 1901
Manufacturers • Carbondale, Pennsylvania • Telephone: 300
"CROSS" SERVICE AGENCIES in Principal Cities
New York, N. Y.—101 Park Ave.—MUrray Hill 5-0253
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In a Hayward, there's no contact between the closing mechanism and the material handled. This means much less wear, reduced upkeep, big savings in bucket maintenance. THE HAYWARD COMPANY, 50 Church St., New York 7, N.Y.

HAYWARD BUCKETS
CLAM SHELL • ELECTRIC • ORANGE PEEL • GRAPPLES
famous for performance since 1888

Enter 1321 on Reader Card

Slurries... handled at lower cost

The new WILFLEY MODEL K Centrifugal Sand Pump embodies important mechanical improvements especially adapted to the handling of cement slurry and results in stepped-up production and substantial power savings. Individual engineering. Write for details.

A. R. WILFLEY and SONS, Inc.
Denver, Colo., U.S.A.

Buy WILFLEY for Cost-Saving Performance

WILFLEY centrifugal PUMPS

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The A.B.C. Symbol . . .

The right to purchase or refrain from purchasing this publication gives you, the reader, and no one else the power to pass judgment on whether it shall continue to survive.

This symbol represents the standards by which your voluntary response is measured.

It testifies to the advertising value of this publication.

It also serves as a constant guide to our readers' opinion.

ROCK PRODUCTS

This symbol represents our membership in the Audit Bureau of Circulations, your assurance that our circulation facts are verified by independent audit, measured by recognized standards, and reported in standardized reports. These audited facts, available without obligation to interested persons, provide a factual basis for advertising rates, evidence of subscriber interest, facts on market coverage, and facts for appraising our circulation quality and editorial vitality.

HALLMARK OF CIRCULATION VALUE

MANUFACTURERS NEWS

Cummins Engine Co. to expand facilities

CUMMINS ENGINE CO., INC., Columbus, Ind., has announced plans for construction of a major addition to its manufacturing plant with construction to start late in 1958. The new facility, to cost in excess of $6 million including equipment, will provide about 300,000 sq. ft. of additional floor space and will be the largest single building on the present site. It will include new engine test cells, additional space for the assembly of marine engines, diesel-electric generating sets, power units, and adequate boxing areas and shipping docks. The structure also will include an additional power house.

Jeffrey district managers

THE JEFFREY MANUFACTURING CO., Columbus, Ohio has announced the appointment of two managers for its district offices in San Francisco, Calif., and Detroit, Mich. William Davis succeeds Stanley M. Mercier as manager of the office and warehouse at Burlingame, Calif. Mr. Mercier will continue in a consulting capacity with the office until January, 1959, when he will retire. Elmer Longnecker succeeds John Warren as district manager of the Detroit office.

Thew sells Byers Machine

THE THEW SHOVEL CO., Lorain, Ohio has announced the sale of assets of Byers Machine, Inc., Ravenna, Ohio, to a Cleveland investment company. The purchasers will continue to operate Byers' parts department, but production facilities will remain idle as they have been since Thew terminated production in November, 1957.

Henry Jones has been named president and general manager of the new company, which will operate under the name of Byers Machine Corp. Mr. Jones has been with the company for 38 years and had been serving as service and parts manager.

Rejoins Blaw-Knox

AUSTIN K. THOMAS has been appointed to the newly created position of general manager of its Construction Equipment Division, according to an announcement by Blaw-Knox Co., Pittsburgh, Pa. Mr. Thomas, a graduate of Cornell University, has much experience in the construction equipment field including prior service with Blaw-Knox, two years with the Pennsylvania Department of Highways and service in various sales and management capacities with another construction equipment manufacturer.

Multiwall bag firm opens West Coast plant

MULTIWALL BAG manufacturing operations are being established on the West Coast by West Virginia Pulp and Paper Co., New York, N.Y., according to an announcement by David L. Luke, president. The facilities will be located in a newly-constructed plant in Torrance, Calif.

Startup of the new bag operation is being expedited by the purchase of multiwall bag making machinery from Fulton Container Co., Inc., Los Angeles, Calif. Multiwall sales and manufacturing personnel now employed by Fulton will form the nucleus of West Virginia's organization in California.

Houdaille Industries buys Canadian firm

RALPH F. PEO, board chairman and president of Houdaille Industries, Inc., Buffalo, N.Y., has announced that his company had completed negotiations and is purchasing for cash all the capital stock of Provincial Engineering Ltd. of Niagara Falls, Ont., Canada. Provincial manufactures overhead materials handling and power transmission equipment. Its engineering and construction division specializes in the design and construction of ready-to-operate manufacturing plants for cement and mining industries.

Milton T. Smith dies

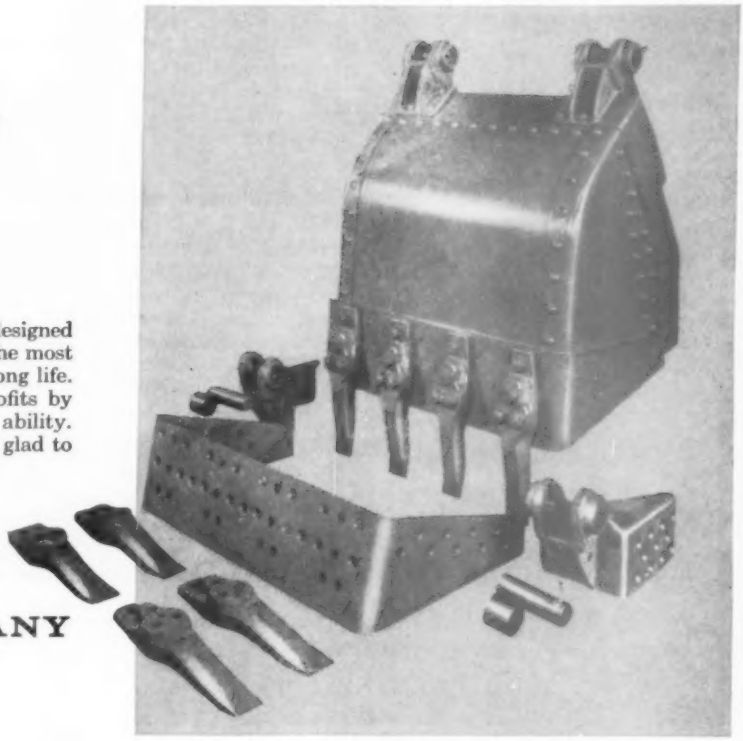
MILTON T. SMITH, who retired July 1 as president of the Marion Power Shovel Co., Marion, Ohio, passed away July 12, at the age of 57. Prior to assuming the presidency of the company in 1954, Mr. Smith had been vice president of Bucyrus-Erie Co., Milwaukee, Wisconsin.

Schield Bantam appointee

GEORGE H. MAASS has been appointed assistant general sales manager for the Schield Bantam Co., Waverly, Iowa. Mr. Maass formerly was with LeTourneau-Westinghouse, Peoria, Ill., where he served as assistant export manager. Prior to that, he was with the J. D. Adams Co., Indianapolis, Ind., serving in various marketing capacities.

(Continued on page 194)

Genuine Blaw-Knox repair parts are the best way to extend service life



Your Blaw-Knox Clamshell Bucket was designed and built as a complete unit to give you the most efficient operation, low maintenance and long life.

Mongrel repair parts cut into your profits by cutting operating efficiency and functional ability. Your Blaw-Knox bucket engineer will be glad to advise you on the proper replacement parts. Call him today.

PARTS IDENTIFICATION SHEETS. Send us the size and serial number of your Blaw-Knox Bucket. We'll be happy to send you the correct parts identification sheet.

BLAW-KNOX COMPANY
Blaw-Knox Equipment Division
Pittsburgh 38, Pennsylvania

BLAW-KNOX

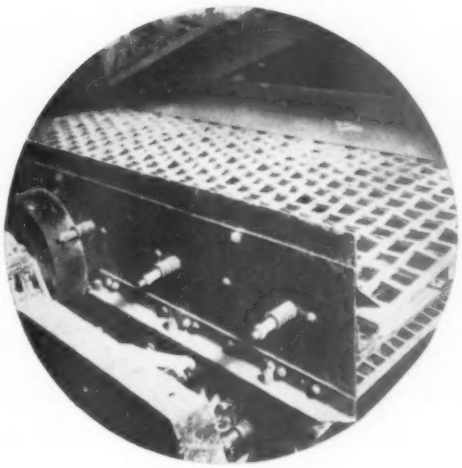
Enter 1281 on Reader Card

ROLLING STONE CAN'T DENT THIS PLATE!

It's made with Hendrick H. Quality Steel

Hendrick H. Quality Perforated Plate is made from high carbon or stainless steels. High carbon can be heat-treated after perforating for a longer life. This tough steel was carefully developed by Hendrick, after many years of experience in selecting and specifying the best analyses of steel for the aggregates industry.

In addition, Hendrick H. Quality Perforated Plate assures uniformity in your product. Full clearance practically eliminates blinding. You get faster deck changes, for lowered labor costs.



The large, open area offers you maximum protection. Hendrick H. Quality Steel Perforated Plate is available either flat, corrugated or stepped, in any desired shape and with perforations of any size. Write to Hendrick today to find out more about this durable Perforated Plate.

Hendrick MANUFACTURING COMPANY
47 Dundaff Street • Carbondale, Pa.

Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens • Hendrick Wedge Wire Screens • Architectural Grilles • Mitco Pan Steel Flooring • Shur-Site Treads • Armorgrids • Hydro Dehazers • Distillation Column Internals

Enter 1282 on Reader Card

MANUFACTURERS NEWS

(Continued from page 192)

Harold F. Allen retires

HAROLD F. ALLEN, chief engineer of Link-Belt Speeder Corp., Cedar Rapids, Iowa, has retired after 42 years of service. Mr. Allen joined Link-Belt Co., Chicago, Ill., as a draftsman and engineer after graduating from Columbia University. He is a member of the American Society of Mechanical Engineers and the Society of American Military Engineers.

Frank J. Strnad has been appointed to succeed Mr. Allen as chief engineer. Mr. Strnad joined Link-Belt Co. in 1934, and has been with Link-Belt Speeder since 1945 when he was appointed hydraulic engineer. He has been serving as assistant chief engineer since 1950.

Searle named president

ROBERT F. SEARLE has been elected president of Arkell and Smiths, New York, N.Y. Mr. Searle, who joined the company in 1948, formerly was vice president—manufacturing.

Also announced was the re-election of Sheldon S. Yates as chairman of the board of directors.

Reedy to new KVS post

RICHARD W. REEDY has been elected assistant vice president of Kennedy Van Saun Mfg. & Engr. Corp., New York, N.Y. Mr. Reedy has been affiliated with the company since 1945, during which time he has served in the sales department and as assistant to the president.

Edward Lebo resigns

EDWARD LEBO, public relations director of Hewitt-Robins, Inc., Stamford, Conn., has resigned to establish his own public relations firm with Hewitt-Robins as one of his clients.

Irwin Miller named to CED commission

IRWIN MILLER, chairman of the board of Cummins Engine Co., Columbus, Ind., has been named to a 25-man independent national Commission on Money and Credit which was established by the Committee for Economic Development. The commission will undertake the first thorough survey of U. S. public and private monetary and financial policies and institutions in half a century.

Ronald L. Fye dies

RONALD L. FYE, chief engineer of McLanahan and Stone Corp., Hollidaysburg, Pa., passed away June 3, at the age of 46. Mr. Fye joined the company in 1932 after attending Pennsylvania State College.

Chain Belt buys plant site

THE ACQUISITION OF 92 acres of land in Madison, Ind., has been announced by Chain Belt Co., Milwaukee, Wis. The site was purchased to provide additional manufacturing capacity for the company's heavy machinery lines. Construction of a new plant building is expected to start shortly.

END

FLEXCO® KEEPS 'EM ROLLING!

Partial view of the conveyor belt system at Material Service Corporation yard #15, Lockport, Illinois. This company is the largest aggregate producer in Illinois. Maintenance men here, and at other Material Service Corporation plants, depend on Flexco fasteners to keep belts operating to maintain tight production schedules.

PROTECT YOUR INVESTMENT IN CONVEYOR BELTS WITH FLEXCO . . . The quality fastener for all heavy-duty conveyor belt applications: SAND & GRAVEL, CRUSHED ROCK, COAL & METALS, CONSTRUCTION EQUIPMENT, etc.

Available in Steel, Monel, Stainless, Everdur. Also Promal top plates.

NEW "25-PAK"

"25-PAK" contains enough fasteners to join common belt widths.

ORDER FROM YOUR DISTRIBUTOR, OR WRITE TO US FOR BULLETIN F-112.

"FOR THE SPLICE OF A LIFETIME"

Flexible STEEL LACING COMPANY

4684 LEXINGTON STREET • CHICAGO 44, ILLINOIS

Enter 1250 on Reader Card

WHERE THERE'S BUSINESS ACTION THERE'S A BUSINESSPAPER

Used to be a song, back in the Thirties, titled, *Little Man, You've Had a Busy Day.* Didn't mention the Big Man. But his days are busy, too. He's the man who must make top-level decisions in business. And to make those decisions, he must have facts. All the facts. All the pertinent information he can get.

He finds time, in his busy days, to get that information. How? By getting a major portion of it from one unique source: the business publications serving his particular field.

No businessman, Little or Big, is fully informed until he reads his businesspaper. He reads it for profit, not for pleasure. He searches it through for news of the trade or industry. For facts. For fresh ideas. For new products he can put to work. And he reads the advertising with the same intense concentration he devotes to the editorial pages.

For the man on his way toward becoming a Big Man, his businesspaper is especially important. Take a tip from the reading habits of key men at every level. Take out a subscription of your own. Then, make the time to read every issue—and read it thoroughly.

Rock Products

THE INDUSTRY'S RECOGNIZED AUTHORITY

MACLEAN-HUNTER PUBLISHING CORPORATION

79 West Monroe Street Chicago 3, Illinois

One of a series of advertisements prepared by THE ASSOCIATED BUSINESS PUBLICATIONS

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CLASSIFIED ADVERTISING
RP—WHERE TO BUY—

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Column Inches Used	Rate Per Column Inch
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4- 8	8.60
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15-19	8.20
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Lower rates on a contract basis. Write for rate card.

Mail to: ROCK PRODUCTS, Where To Buy Dept., 79 West Monroe St., Chicago 3, Illinois

FORMS CLOSE
12th of MONTH
PRECEDING PUBLICATION

Jan.....	July.....
Feb.....	Aug.....
Mar.....	Sept.....
Apr.....	Oct.....
May.....	Nov.....
June.....	Dec.....

CHECK MONTHS
AD TO APPEAR

LIQUIDATION

TWO COMPLETE BRIQUETTING PLANTS

Locust Summit, Pa. and St. Nicholas, Pa.

4—Ruggles-Coles Class #XA-18 double shell indirect-direct heat rotary dryers, 104" x 70' x ⅝" welded steel outer shell.

4—Komarek-Greaves briquetting presses, 75 HP, 25 tons per hour.

4—Komarek-Greaves vertical Fluxers (paddle mixers), triple shaft, 150 HP.

4—K-G Horiz. Fluxers 41" dia., 50 HP.

4—K-G Pug Mills, 30" dia. x 14'4" long.

8—Tyler Screens, 4'x8', 4'x6'.

2—42" wide travelling-screen cooling conveyors, total of 950'

2—8'6" dia. x 70' long rotary hot air dryers.

4—36" x 24", 24" x 18" Jeffery hammermills, 50 HP, 25 HP.

3—Robinson Size #13 Sawtooth Crushers.

4—Pa. Crusher #C-3-30 hammermills, 60 HP.

20—Welded Steel bins, cone bottom, from 15,000 gallon to 90,000 gallon sizes.

4—Keeler Boilers 200 HP, 160 PSI.

8—16", 18" and 24" trough-belt conveyors, 100', 250', 500' long.

6—36" & 48" wide apron feeders, 8' long.

8—Bucket elevators, 62' and 90' c-c.

6—500 KVA Transformers.

300—Motors and controls, 1 HP to 150 HP.

ALSO—Chain hoists, steel pipe, valves, hoppers, blowers, misc. equipment, etc.

BUILDINGS—(2) All Steel Buildings 50' wide x 198' long, 60' high under roof trusses, clear span.

REAL ESTATE—7.8 Acres at Locust Summit, Pa. 6.0 Acres at St. Nicholas, Pa. Served by Reading Railroad—With Private Tracks

SEND FOR DETAILED CIRCULAR

PERRY EQUIPMENT CORP.
1418 N. 6th St.
Philadelphia 22, Pa.
Poplar 3-3505

HEAT & POWER CO., INC.
60 E. 42nd St.
New York 17, N.Y.
Murray Hill 7-5280

ELEC. AIR COMPRESSORS
3—3078 CFM Inger. Rand 500 H.P. New 1947
1—3876', 1—1578' and 2—1098' Inger. Rand
DIESEL ELEC. LOCOMOTIVES
4—65 ton Whitcomb 2—25 ton & 1—70 Ton G. E. 20 Ton Davenport Gas & 1-45 ton
ROTARY DRYERS & KILNS
36" x 20', 5' x 25', 6' x 72', 8' x 150', 7' x 120
REDUCTION MILLS & FEEDERS
8'6" x 12' Marcy Rod
6'6" x 14'6" Marcy Rod Mill
4' x 8' Hardinge Rod Mill
5' x 10' Kennedy-Van Saun Rod Mill
2—No. 77 & 1—96 Marcy Ball Mills
8' x 60" Hardinge Ball Mill
4'-0" Traylor Type TY Reduction Crusher
24" x 36" Pioneer Jaw Crusher
36 x 42 Traylor Jaw Crushers
25B Telsmith Primary Breaker
36" Superior McCully Primary
30" x 36" Traylor Type H Jaw Crusher
18" Superior McCully Secondary
15x24 & 10x36 Cedar Rapids Jaw
60" x 15' Traylor HD Apron Feeder
VIBRATING SCREENS
2—4 x 8 Seco 2 Deck. 1—5 x 12, 3 Deck A. C.
4 ELEC. WHIRLEY CRANES
2 Amer. R25-75 Ganty 165' Boom
2 Amer. R20-60 Ganty 139' Boom

R. C. STANHOPE, INC.
60 E. 42nd St., N.Y. 17, N.Y.

FOR SALE or RENT
65 ton Whitcomb diesel elec. loco.
44 ton Gen Elec. diesel elec. loco.
25 ton Whitcomb diesel elec. loco.
50 ton American guy derrick 115' mast 100' boom
90 HP Lidgerwood 2d diesel hoist.
150 HP Amer. #140 3d gas hoist.
1½ yd. Lima 602 crane. 110' boom.
2½ yd. Link-Belt K-595 crane 120' boom. Cat. diesel
60 ton Manitowoc 3900 crane. New 1954. 100' boom. Cummins diesel
110 HP Clayton Port. steam generator

WHISLER EQUIPMENT CO.
1905 Railway Exchange Bldg., St. Louis 1, Mo.
CHestnut 1-4474

Harrop Tunnel **KILN** 250' x 4', kiln cars etc.
EQUIP. this territory: 30 ton diesel Loco. Crane 2036 Port. Plant, 3x8 Vib Screen, 1842, 3018, 5424 Rolls Dust Collectors, Contrs. Towers, Barges, Trenchers, Tractors, Trucks, Whiting Truckmobile, 2x8' Feeder, Gravity Roller Conveyor.
Portable Rock Crushing, Washing & Ready Mix **PLANTS.**
CRUSHERS: 24x36 CR RB Jaw w/3x8 feeder, 28x36 Traylor PB Jaw, 30x42 Pioneer & Telesmith RB Jaws, 42x30 Superior w/motor, 48x60 Allis C. Telsmith 13B 24", 28", 36" GYR. 2, 3, 4, 5½ & 7' CONES.
CONVEYERS: 24x290, 36x150, 42x160, 60x300'. Hardinge 8'x48" Scrubber, also Log Washers. 42"x12' Apron, Syntron F55 **FEEDERS.**
25 ton Koehring, 30 ton Lima Truck **CRANES.**
MILLS: 4½x16", 6x18", 7x36" Hardinge Conical, 4x6 KVS, 6½x6 & 6x15 Ball. 16x39, 3033 CR Hammer.
435 KW & 938 KW Diesel **GENERATOR SETS.**
DRYERS: 4½x36, 5x40, 6x60, 8x124, 8x9x100.
SHOVELS-DRAG: NW80D, Marion 40A, Lorain, 820 Lima, 1201 & 2400 BE 320B, 9W, 209W.

MID-CONTINENT EQUIP. CO. INC.
8321 Gannon—St. Louis 24, Mo.—Wydown 1-2826

FOR SALE

HAMMERMILL—S-6 Penna 42 x 32

FEEDER—24" x 18' Pan Feeder with 3 HP Speed Reducer.

COLLECTOR—DUCON 15 Cyclone, 11,000 CFM capacity. Made from $\frac{5}{16}$ Plate.

SCREEN—Rotex Model 421 Sifter 5' x 7'

G. & W. H. CORSON, INC.
Plymouth Meeting, Pa.

SURPLUS EQUIPMENT

Available throughout the U.S.—Items you need may be available near you. Your inquiries would be appreciated.

Buildings	Draglines	Loaders	Pavers
Bins	Ditchers	Locomotives	Rollers
Barges	Dredges	Mixers	Rail
Buckets	Drills	Motors	Scales
Belting	Derricks	Machine-tools	Screens
Cableways	Engines	Mills	Slacklines
Cars	Excavators	Pulverizers	Shovels
Compressors	Feeders	Pipe	Tanks
Conveyors	Graders	Pumps	Tractors
Crushers	Generators	Kilns	Trailers
Dryers	Hoists		Etc., Etc.

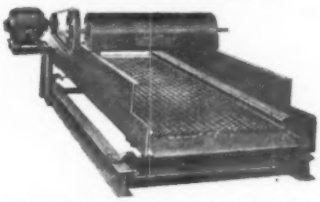
(I can sell your surplus equipment)

ALEX T. MCLEOD
MARIETTA, KANSAS

BONDED EQUIPMENT BARGAINS

NEW CURRENT MODELS IMMEDIATE SHIPMENT FROM OUR FACTORY - WRITE, WIRE OR PHONE FOR FREE CATALOG AND PRICES

NEW BONDED® GENERAL DUTY VIBRATING SCREENS



NEW BONDED® HEAVY DUTY VIBRATING SCREENS

For mineral, chemical and other industrial products. Fast, efficient and economical for cleaning, sizing, grading, dewatering. Made in all metals, including stainless steel. Enclosed models for hot materials or dust control. Bonded screens are built for any screening operation, wet or dry.

GENERAL DUTY SCREENS, TYPE A: Eccentric weight mechanism, spring mounted, 1 to 3 decks, 2' x 4' to 3' x 8'. **WRITE FOR BULL. #1086.**

Model Number	Screening Area	No. of Decks	Sale Price
124A	2'x4'	1	$ 443
224A	2'x4'	2	472
126A	2'x6'	1	472
226A	2'x6'	2	501
134A	3'x4'	1	504
234A	3'x4'	2	570
136A	3'x6'	1	581
236A	3'x6'	2	688
336A	3'x6'	3	956
138A	3'x8'	1	675
238A	3'x8'	2	815
338A	3'x8'	3	996

HEAVY DUTY MODELS, TYPE B: Four bearing positive throw eccentric shaft: 3' x 6' to 5' x 14', 1 to 5 decks. **WRITE FOR BULL. #1087.**

Model Number	Screening Area	No. of Decks	Sale Price
336B	3'x6'	3	$1620
436B	3'x6'	4	1685
138B	3'x8'	1	1510
238B	3'x8'	2	1620
338B	3'x8'	3	1735
248B	4'x8'	2	2310
348B	4'x8'	3	2440
2410B	4'x10'	2	2400
3410B	4'x10'	3	2550
2412B	4'x12'	2	2590
3412B	4'x12'	3	2970
4412B	4'x12'	4	3165

NEW BONDED® TROUGHING IDLER CONVEYOR BARGAINS

Remember, You Save Up To 50%

CONVEYOR PRICES INCLUDE BELTING

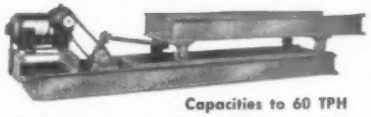
Complete Pre-Fab sections of 8" Jones & Laughlin Jr. I Beam Frame Conveyors quickly and easily joined together on the job. These beams are rolled with .20% Copper Content. Atmospheric exposure tests disclose that Junior Beams, with .20% Copper have as much as four times the resistance to corrosion as non-copper steels. Braced with structural angle, welded to frame for maximum rigidity. Equipped with 5" roll diameter idlers and return rolls, 20" diameter head pulley and 16" diameter tail pulley, mounted on 2 1/16" or 2 7/16" diameter shaft.

We take our loss on our stock of short length belting. You can save as much as 50% on BONDED CONVEYOR SPECIALS, with conveyor belting in two pieces. Belt is new 4-ply, 28 oz. duck, 1/16" top rubber cover x 1/32" bottom cover Major grade belt and is Fresh Stock made by leading manufacturers. **WRITE FOR BULLETIN #1138.**

Bonded troughing idler conveyors also available in Truss Frame Construction. **WRITE FOR BULLETIN #1189 AND PRICES.**

Belt Width	Length of Conveyor	List Price	Sale Price	Add or Deduct Per Ft.
14"	25'	$1397	$ 722	
14"	50'	2222	1144	$16.84
14"	86'	3377	1733	
16"	20'	1262	636	
16"	45'	2137	1088	
16"	60'	2662	1359	18.04
16"	90'	3712	1900	
18"	25'	1477	794	
18"	45'	2217	1166	
18"	70'	3142	1648	
18"	85'	3697	1933	19.24
18"	100'	4252	2220	
18"	130'	5362	2797	
20"	25'	1517	828	
20"	60'	2882	1533	
20"	75'	3467	1838	20.37
20"	90'	4052	2145	
24"	25'	1590	898	
24"	45'	2430	1330	
24"	70'	3480	1875	
24"	100'	4740	2514	21.78
24"	120'	5580	2950	
24"	150'	6840	3603	
30"	50'	2911	1617	
30"	70'	3871	2119	24.75
30"	90'	4831	2614	
36"	25'	1818	1118	
36"	45'	2858	1678	
36"	60'	3638	2096	27.95
36"	100'	5718	3214	

NEW BONDED® FEEDERS



Capacities to 60 TPH

Bonded EF Series Economy Feeders are ideal for confined spaces and in portable plants. For medium duty service. Available with or without hoppers. **Priced From $224.00**

Bonded HDF-18 Heavy Duty Feeders were especially designed for abrasive materials such as Ore, Rock, Crushed Stone, Gravel, Sand, Clinkers, Abrasive Volcanic Ash and Rock Abrasion Resistant Alloy Steel Plate is used for all parts that contact the material. Capacities to 440 Tons Per Hour.

HDF Series Plate Feeder - Priced From $925.00

WRITE FOR BULLETIN No. 1211

NEW BONDED BUCKET ELEVATORS

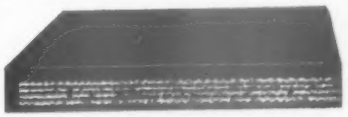
Open or Enclosed, Vertical or Inclined Bucket Elevators with Continuous or Spaced Buckets mounted on Chain or Belting. Bonded ▸ is standard models mean lower prices and you get a Custom Built Elevator at no extra cost.

There is a style of bucket for virtually every material or condition wet or dry, lumpy or fine, granular slivery, or pellet shapes, hot or chemically active. A complete line of Continuous Steel, Salem Steel and Malleable Iron Buckets available in a wide variety of sizes, shapes, gauges and styles at low prices.

WRITE FOR BULLETIN #1203 AND COMPLETE PRICES.

NEW CONVEYOR BELTING AT NEW LOW PRICES SAVE UP TO 44%

WE PAY FREIGHT ON 200 POUNDS OR OVER



QUALITY TESTED CONVEYOR BELTING*

Major Brand: 12# to 15# Average Friction Pull. 800# to 1000# Average Cover Tensile.

Heavy Duty 4-ply, 28-oz. duck, 1/16" top rubber cover x 1/32" bottom rubber cover belting having high tensile strength, tough cotton duck, strong carcass and proper flexibility. For heavy boxes, bags and bulk materials. Troughs easily. Famous brands at deep cut prices. Fresh stocks.

Width	Ply	List Price	Sale Price
14"	4	$3.63 ft.	$2.29 ft.
16"	4	4.08 ft.	2.41 ft.
18"	4	4.51 ft.	2.66 ft.
20"	4	4.97 ft.	3.08 ft.
24"	4	5.85 ft.	3.45 ft.
30"	4	7.18 ft.	4.22 ft.
36"	4	8.51 ft.	5.01 ft.

Major Bee Brand: 16# to 19# Average Friction Pull, 2500# to 3000# Average Cover Tensile. Skim coat between plies.

A high grade of heavy duty 4 and 5-ply, 28 oz. duck, 1/16" top rubber cover x 1/32" bottom rubber cover. These belts are for more severe service, high tonnages and abrasion resistance. For handling stone, mineral ores, concrete, cement, coal, and other similar materials, both wet and dry. Belts have molded rubber edges.

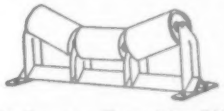
Width	Ply	List Price	Sale Price
14"	4	$ 4.31 ft.	$2.48 ft.
16"	4	4.85 ft.	2.80 ft.
18"	4	5.39 ft.	3.10 ft.
20"	4	5.90 ft.	3.54 ft.
24"	4	6.94 ft.	4.00 ft.
30"	4	8.53 ft.	4.92 ft.
36"	4	10.09 ft.	5.95 ft.
24"	5	8.14 ft.	4.68 ft.

***All belting is tested by the Engineering laboratory of one of the largest universities in the United States. It is guaranteed to meet or exceed listed specifications.**

Other widths, plies, duck weights and cover thickness available at low prices.

WRITE FOR FREE SAMPLE & BULL. #1209

NEW IDLERS AND RETURN ROLLS SAVE 25% AND MORE



3-roll, 5" diameter Troughing Idlers for:

14" belt	$18.50	24" belt	$21.25
16" belt	19.25	30" belt	22.00
18" belt	20.50	36" belt	22.75
20" belt	20.75	48" belt	25.50

1-roll, 5" diameter Return Idlers for:

14" belt	$7.25	24" belt	$ 8.50
16" belt	7.50	30" belt	9.50
18" belt	8.00	36" belt	10.00
20" belt	8.25	48" belt	11.50

All steel. Interchangeable with other well-known makes. Furnished with replaceable prelubricated sealed ball bearings. Maintenance is negligible. **WRITE FOR BULLETIN #1138.**

BONDED SCALE AND MACHINE COMPANY

PHONE Days: Hickory 4-2186 — **WRITE FOR FREE CATALOG AND PRICES** — **PHONE Evenings: AX. 1-2213, NU. 6-3156**

128 Bellevue — **Mfrs. of Scales, Conveyors, Conveyor Parts, Idlers, Vibrating Screens, Crushers and Feeders** — **COLUMBUS 7, OHIO**

SPECIAL ITEMS

Iowa 53"x60" dbl. Impact hammermill
Sturtevant 16" air separator 75 HP elec. motor
Pangborn CH-2, exhaust blower, etc.
Traylor 56"x72" sectional frame jaw crusher
Traylor 4' Model TY crusher. Numerous spare parts.
Symons 4¼' cone crusher, std. head coarse bowl
Nordberg Gyradisc 54" 200 HP elec. motor
Belt conveyors 24" 30" 42" var. lgths some w/elec-tro mag. hd. pulleys: 24x24" 30x20" 24x30" 36x42".

CONCRETE MIXERS

Ransome Model 84S, 3 yd. tilting type
Smith 422, 4 yd. tilting type
Koehring 56S 2 yd. tilting type

TRUCKS—TRANSIT MIXERS

15 Ford F8-6 yd. end dump. Excel. Reinforced, 1955.
10 Mack LRSW 32 ton rear dump trucks Cummins NHIRS-600 300 HP Diesel Motor Allison converter-transmission.
6 Euclid 36 TD end dumps 200 HP Cummins Diesel
2 Int. LF-192 Blaw Knox 6½ yd. 1953.
6 Smith tan. ax. Diesel, 1953, 5½ yd. mixing
4 Smith tan. ax. 4½ yd. mixing

CRUSHERS—KILNS—DRYERS

JAW: Acme 10x20, 15x36, 14x36, 14x38, 10x42, 16x32, 18x32, 25x40. Eagle 10x16, 20x36. Diamond 24x36". Cedar Rapids 10x20, 15x36, 30x36, 25x40. Farrell 10x20, 18x30, 14x36, 18x36, 36x48. Buchanan Type C 30x42, 36x42. Traylor 18x36, 24x36. Allis-Chalmers 30x18. Good Roads 10x30. Telsmith 18x32. Pioneer 30x42. Universal 18x24.
GYRATORY: Al-Chal 6, 7½, 8, 9, 10, 12, 16, 18, Telsmith TY 4', 3' Gyrosphere
25B Kennedy Van Saun 13, 37½, 38, 49½"
ROLL: Cedar Rapids 40x20. Pioneer 40x22. Pioneer 30x18. Telsmith 24x16.
HAMMERMILL: Jeffrey Type B3 24x20, Type B 36x24, 56x36, 36x42. Eagle 24x24, Stedman 24x30, 36", 42". Cedar-Rapids 50-50, 30x33.
BALL MILL: Hardinge conical 10'x48", 8'x48". 8'x36", complete, motors, Traylor 7'x35'.
TUBE MILLS: Smidth 6'6"x21', 5½x20'.
ROD MILL: Marcy 5'x8' center discharge Marcy 5'x6' Denver 5'x8' center discharge, Marcy 5½x12'.
AUTOCLAVES: J&C 6'6"x58' Quick Acting; 6'x50'
CONE: Symons 3', 4¼', 7'.
KILNS: 4'x42', 5'x30', 6'x50'6", 6'4"x45', 6'x72' Vulcan 9x160, 10'6"x105', 8'x124', 6'x90', 6'x72'.
DRYERS: 6'x60', 6'x72', 5'x24', 4'6"x32', 3'6"x20', 6'x30', 5'x25' rotary current.
COMPER MILLS: A-C 7'x24', Patterson 7x18.
FEEDERS: Synstron F55 48x72", 48x60", Jeffrey 35x72".

CRUSHING PLANTS

Universal 880 Senior B and 839 Washing plant
C-R NEW NEVER USED complete 2236 jaw, 3033 hammermill, material washer, conveyors, motors etc. Diamond 77, new 1956, 10x36 jaw, roll, comp Port. Pioneer Port. 10x24 jaw 24x16 roll compl. Diesel
Cedar Rapids 20x36 jaw crusher Cat. D8800 Diesel power, 40x22 triple roll crusher.
C-R 2540 Prim. Port. Diesel
A-W 61E 1024-10C6 jaw crusher
C-R Primary Port. 22x36 Jaw. Diesel.
Eagle 36x25" single screwspiral flights washer classifier dehydrator

CONCRETE PLANTS AND EQUIPMENT

NEW, complete, Heltzel, 2-488 Smith tilt. mixers, 4 yd. aggr. batcher 1000 bbl. cement etc.
Butler 1200 bbl ground cement silo re-circulating B-K 3 compt. aggr. 180 ton Heltzel 450 bbl. Cement bin. Complete.
Eric Strayer port. New 1955, 40 yds. per hr. 600 bbl. cement silo
Johnson 400 yd 5 aggr. 1500 bbls. cement batch 5000 bbl. silo 2-3 yd mixers
Johnson automatic batch 10,000 bbls. cement storage 2-2 yd mixers; screening equipment.
Johnson TY 228 2 compt. agg. w/TY1320 cement unit
Blaw-Knox 100 ton 3 compt. aggregate bin
Blaw-Knox BCPC 600 bbl cement silo
B-K BCPC 400 bbl High cement bin 400 bbl silo.
Blaw-Knox BCPC 200 bbl cement bin.
Auto-Crete port. batching plant, self contained, elec. up to 150 yds per day; one man operation.
Pre-Mix 150 ton 4 compt. 3 aggr. 1 cement; ground cement silo 2 yd concrete mixer. New 1955.
Erie Strayer Port. 3 compt. aggr. 600 bbl cement
B-K 2 aggr. one cement 400 bbl silo. Complete

HYDRAULIC SUCTION DREDGES

Morris 16"x8" Diesel. Pontoon mounted.
10" Portable Diesel powered. Complete.
12" Diesel powered, pontoon mounted. Complete.
Ellicott 8" with cutter. Diesel Hull 48'x18'x3'6".
20' Ellicott Diesel 155'x49'x8'.
6" Hydraulic Diesel. On 32'x8' steel pontoons.
Amsco 10" Diesel power portable. Excellent.
6" portable Diesel complete with cutters, etc.

SCREENS

Trommel 6'x45'3" 75 HP gearhead A.C. motor.
New Holland 4'x12' 2 deck, V-belt drive
Tyler-Hummer 4'x10' 2 deck, new spare parts
Simplicity 5'x12' 2 deck 30 HP
Pioneer 5'x12' 2 deck 20HP elec. motor
C-R 4'x14' 2 deck 25 HP motor

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CO 7-0723 Cable: RICHWALSH

"FASTER FROM FOSTER"
RAIL
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Nation's Largest Warehouse Stocks
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LIQUIDATION

KILNS—COOLERS—DRYERS

1—Traylor 11' x 155' Rotary Kiln.
1—Traylor 10' x 120' Kiln.
1—Vulcan 8' x 125' Rotary Kiln.
2—Vulcan 8' x 60' Rotary Kilns.
1—Vulcan 6' x 50' Rotary Kiln.
2—Ruggles Cole 90" x 55' Rotary Dryers.
1—Gt. Western 6' x 50' Rotary Dryer.
1—Rennenburg 5'6" x 50' Rotary Dryer.
3—Link Belt 3'10" x 20', 5'2" x 20', 6'4" x 24' Roto Louvre Dryers.

PULVERIZERS—MILLS—CRUSHERS

1—UNUSED Penn. 5060 Non-Clog Hammer Mill.
2—5 Roll Raymond 5057 high side Roller Mills.
2—Kennedy No. 6 Gyratory Crusher.
1—4'6" x 6' Continuous Ball Mill.
2—54" x 24" double roll Crushers.
1—Symons 30" Impact Crusher.

SCREENS—CONVEYORS—BINS

3—Gayco 8' and 5' Air Separators.
4—Tyler Hummer 4' x 5' Screens.
5—Link Belt, Allis Chalmers 3' x 8' Screens.
1—Symons 3' x 8' double deck Screen.
2—42" Apron Conveyors 65' long.
8—24" Troughing Belt Conveyors 18' to 150'.
6—18" Troughing Belt Conveyors 35' to 80'.
20—Steel Bins and Hoppers from 50 to 500 ton capacity.

Send for Complete Specifications

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Every Item Priced for Quick Sale

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MARION-OSGOOD 810 Shovel-Crane, 1½ cy., w/671 GMC & Torque converter, air controls, late model, excellent. $19,500 as shovel. Rent $1500/mo. apply purchase. Yard.
P&H 655 Shovel Front, good. $2000 Yard
BUCYRUS ERIE 22B Shovel Front, new. $3000 Yard.
UNIT 1020A Shovel Front, brand new, complete w/accessories. $950 Utah.
P&H 255A Shovel Fronts, some new, some slightly used. Bargain. $650 to $900. Yard.
P&H 655 Shovel Buckets, Amsco, brand new, complete. Bargain. $900 Yard.
CEDARAPIDS 20x36 rb. Jaw Portable Primary Plant w/feeder, conveyor $12,000
UNIVERSAL 203Q Plant w/18x24 rb. Jaw, feeder, hammermill, 3/10 screen, rotovator, tandem rubber. Good. $16,000 Rental Purchase.
PIONEER 32x40 rd. Jaw Crusher, new bearings, good. $14,500 Yard.
JAW DIES for CEDARAPIDS 32x40 & 25x40, also DIAMOND 32x40. Brand new. Manganese steel. Both stationary & movable. Cost over $900 each. Sell ⅓ price $450 each.
GILSON #22 Hammermill, 30x22, good. $400
GILSON #28 Hammermill, 30x28, good. $950 Yd.
CEDARAPIDS 30x33 Hammermill, good. $2750 Yard.
LIPPMANN 36x32 Hammermill, good. $2000 Yard.
UNIVERSAL Twin Dual Roll Crusher, 30x18 & 30x17, like new. $4500 Yard.
CEDARAPIDS 3x8 Apron Feeder w/hopper & motor. Good. $1650.
CEDARAPIDS 36"x30' apron feeders, good. $3750.
(2) **DAVEY** 210 cfm Compressors, Portable on rubber, Hercules diesel, rebuilt, late model. $2250 Yard. Rent $200/mo. apply purchase.
WAGON DRILLS, Ingersoll Rand FM2 w/air motor on rubber. $650 Gardner Denver on rubber w/air motor. $700 Also Cleveland D14 on rubber. $450 All tested & in good condition. Yard.
CAT. 30 KW Generator Set w/D4800 diesel, good. $2250 Yard.
GMC Twin Diesel, 320 hp, rebuilt, latest conversions. $4250 Yard.

WENZEL MACHINERY CO.
585 S. 10th—Kansas City, Kans.—Mayfair 1-1710

OUR 50TH YEAR

Niagara 1-Deck Screen 2½' x 12'
Niagara 2-Deck Screen 3' x 8'
Seco 3½-Deck Screen 3' x 8'
Seco 2-Deck Screen 4' x 8'
Hummer 1-Deck Screen 6' x 5'
Revolv. Screen 48" x 20', trunnions
New Universal 1-Deck Screen 3' x 5'
New Universal 1-Deck Screen 3' x 8'
6" Encl. Perfect Discharge Elevator
6" Enclosed Bucket Elevator
8" Enclosed Bucket Elevator
Sandvik Steel Conveyor 30" x 45', with idlers and pulley
Acme Jaw Crusher 9" x 16"
Reliance Jaw Crusher 9" x 16"
Cedar Rapids Secondary Portable Crushing Plant—25 Yd.
15 Ton Stiffleg Derrick, 110' Boom
Sullivan Elec. Tugger Hoist, 7½ H.P.
Small Gasoline Water Pumps
Eriez Permanent Magnetic Pulley 15 x 16"
Misc. Size Large Conveyor Pulleys
42" & 48" Trough Idlers, Antifriction
36" Trough Idlers, 5 roll type
36" Trough Idlers, 3 roll type, R.B.
20" Roller Bearing Idlers and Belting
20" and 24" Plain Brg. Idlers, 5 roll
18" and 24" New Idlers

WANTED
JAW CRUSHERS—DEWATERING SCREWS—CONVEYOR IDLERS— SMALL GYRATORY CRUSHERS—SMALL VIBRATING SCREENS—VIBRATING FEEDERS, SYNTRON OR JEFFREY

G. A. UNVERZAGT & SONS INC.
136 Coit Street Irvington 11, N.J.
Essex 3-8105

SPECIALS

6'-5"x100' Kilns
#1 Sturtevant rotary fine crusher

CRUSHERS

1—30" x 36", 24" x 36", 18" x 36", 15" x 30", 12" x 24" Jaw Crushers.
2—42" x 16" Allis-Chalmers Crushing Rolls, rebuilt. 36" x 16 rebuilt Sturtevant rolls.
2—24" x 12" Rogers Iron Works Crushing Rolls, Rebuilt.
1—6", 10", 16", 20" McCully Superior Gyratory Crushers.
No. 3 up to No. 12 Gyratory Crushers.

BALL & TUBE MILLS

2—5½'x20', 5'x22', 6'x22', 7'x24' & 7'x35'

MISCELLANEOUS

15 ton hydrated lime plants

We make new dryers and kilns.

Have you any machinery that you want to sell?

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GIVE THROUGH YOUR UNITED FUND OR COMMUNITY CHEST
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CLASSIFIERS: 2—Akins and two Wemco 78" double pitch, duplex, 36 ft. steel tanks, complete with motor, drive, etc. New 1956. Condition guaranteed. One Dorr 19'x8'x37'6" Bowl & Take Classifier complete with motor and controls. New 1956, condition guaranteed.

HEAVY MEDIA PACKAGE UNIT, semi-portable, bolted construction, capacity 30 TPH, complete with 7 ft. Cone, Densifier, Pumps, Magnetic Separators, Rectifier, Controls, etc. Condition guaranteed. New 1956.

PULVERIZER: Marcy 8'x12' Rod Mill, center peripheral discharge complete with 350 H.P. motor, speed reducer, etc. New 1955, condition guaranteed.

DRYERS, KILNS, COOLERS: Two 8'x25' Kilns, One 9'x130' Kiln, One 10'x200' Kiln. One 104"x65' Dryer, One 104"x70' Dryer, One 5'x50' Dryer, One 3'x27' Dryer, One 90"x55' Dryer. One 6'x50' Cooler, One 5'x50' Cooler, One 5'x60' Cooler.

REDUCTION CRUSHERS: Nordberg 4¼ ft. Cone with 200 H.P. motor. Nordberg Gyradisc 54" with 200 H.P. motor.

JAW CRUSHERS: 4"x8" to 48"x60".

OVERHEAD ELECTRIC TRAVELING CRANES: One 6 ton, 80 ft. span, and one 10 ton, 80 ft. span; both 4 motor, cage control, bucket operating, 440 volt, A.C. One 25 ton, 56'4" span, 125 volts, D.C.

COMPRESSORS: Two Ingersoll Rand 33x20½x24, 3864 CFM, 100 lbs., 2200 volts.

LOCOMOTIVES: 4—G.E. and G.M. 80 tons and 90 tons, new 1956. Condition like new.

BELT CONVEYOR: 18"x60 ft. with steel support, all mechanical parts, motor and drive.

CARS: 10 yd. capacity Phoenix std. gauge, heavy duty Quarry Cars, automatic couplers.

MINER: Joy continuous Miner model 3 JCM-4, height 34", width 90", capacity 2 to 3 tons per minute, 440 volt, A.C. Condition like new.

MOTOR: 900 H.P. Synchro, 180 RPM, 2300 volts, with magnetic clutch and all controls. New 1956.

AIR SEPARATORS: One 5 ft. Sturtevant. One 10 ft. Sturtevant.

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LANSDOWNE, PA.
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7' x 120' Rotary Kilns
Komarek-Greaves Briquetting Presses 27" x 23"
104" x 70' Ruggles Cole Dryer
9' x 125' Rotary Kiln 30 HP.
502-16 & 705-24 Roto Louvre Dryers
8' x 50' Allis Chalmers Oil Fired 20 HP Dryer
6' x 50' Rotary Steam Tube Dryers
5' x 40' x ⅜ Rotary Kiln
6' x 30' Rotary Coolers
#60 Williams Hammermill
Robinson #13 Saw Tooth Crusher 15 HP.
Jeffrey Hammermills, 36" x 24"; 24" x 18"; 20" x 12"; 15" x 8" all M.D.
Pennsylvania C-3-30 Hammermill, 60 HP.
#6669 Raymond 6 Roll High Side Mill
#3036 Raymond 3 Roll High Side Mill
#5057 Raymond 5 Roll Hi-Side Mills
2000' of 24", 18", & 16" throughing Belt Conveyor
42" x 500' Apron Conveyor, mesh belt
Pug Mills—3'9" x 12' x 12' Vertical
Pug Mills—3' x 13' Horizontal
4' x 6' & 4' x 8' Tyler Hummer Screens
18" x 16', 36" x 6', 48" x 8' Apron Feeders
18 Steel Welded Bins, 15 to 200 ton

Full details on request

ROCK PRODUCTS DIV.
HEAT & POWER CO., INC.
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Caterpillar "D-6" Used Tractor, S/N 9U-5482 (1950 model), w/ Trackson Cable-controlled Hi-Lift Front End Loader. Excellent shape.

Caterpillar "D-6" Used Tractor w/LaPlant-Choate Hyd. Dozer, with Scraper.

Caterpillar "D-4" Used Tractor, S/N 7U-21979SP, w/Trackson Hyd. Front End Loader. Excellent Condition.

I-H "TD-9" Used Diesel Tractor w/Hough Hydraulic Front End Loader.

TRANSIT MIXERS

Jaeger 3 Yd. Hi-Discharge (4¼ yd. Agitator) repaired, blasted & painted. Mounted Chevrolet tandem truck.

Smith 3 Yd. Hi-Discharge (4¼ yd. Agitator) mounted Chevrolet Tandem Axle Truck, low-priced.

Rex 5½ Yd. Adjusta-Wate Moto-Mixers, mounted or un-mounted (4).

CRUSHING EQUIPMENT

Universal "916" R. B. Jaw Crusher*.

Gruendler Port. Pulverizing Plant, 3x8 feeder, "3XB" Mill, 30" belts, discharge conveyor, GM "671" diesel power, 1957 model.

Dixie Port. Pulverizing Plant, 3x8 feeder, 3x8 Cedarapids screen, 3036 Dixie mill, 30" Under-discharge conveyor, GM "671" diesel power unit. 6 Years old. Completely overhauled.

Wisconsin-Foundry Port. Gravel Plant, feed hopper, 9x35 jaw, 3018 roll, 4x8 2-deck screen, 24" conveyor, less power. Low priced.

NOTE: All This Equipment Located in our Yard except *

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GOOD USED EQUIPMENT FOR SALE

650-B Bucyrus Erie Elec. Drag, 195', 16 yd.
15-W Bucyrus Erie Elec. Drag, 215', 13 yd.
631 Page Elec. Dragline, 200', 8 yd.
9-W Bucyrus Erie Elec. Drag, 200', 8 yd.
625 Page Diesel Drag, 150', 10 yd.
723 Page Diesel Drag, 130', 10 yd.
621-S Page Diesel Drag, 125', 7 yd.
200-W Bucyrus Erie Diesel Drag, 125', 6 yd.
7-W Bucyrus Erie Diesel Drag, 180', 5 yd.
5-W Bucyrus Erie Diesel Drag, 120', 6 yd.
2400 Lima Drag, 130', 5 yd.
4500 Manitowoc Drag, 120', 5 yd.
3900 Manitowoc Speedcrane, 100' boom.
3500 & 3000 Manitowoc Crawler Cranes.
750-B Bucyrus Erie 20 yd. Elec. Shovel.
5480 Marion 18 yd. Elec. H.L. Shovel.
170-B Bucyrus Erie 6½ yd. Elec. Shovel.
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4500 Manitowoc 5 yd. H.L. Shovel.
1400 P&H 4 yd. Elec. Shovel.
Large selection of smaller Shovels and Draglines available.
Model T-750 Reich Truck Mounted Rotary and Down-the-hole Drill.
McCarthy & Compton Coal Auger Drills.
Euclid Trucks, Truck Cranes, Dozers, Scrapers, Front End Loaders, Drills, Buckets, Attachments and other misc. equipment available.

FRANK SWABB EQUIPMENT CO., INC.
313 Hazleton Nat'l. Bank Bldg.
Hazleton, Pa., GLadstone 5-3658

QUARRY EQUIPMENT

Cedarapids 3042 double impeller. Rebuilt
Cedarapids 2033 Hammermill secondary plant on rubber.
Telsmith 24" cone crusher. Good.
Telsmith 13 B gyratory crusher.
Scottdale model 63 double roll coal crusher.
26" x 8'4" apron feeder with drive.
Robins 4' x 9' triple deck screen.
New Holland 4' x 12' double deck screen. Rebuilt
Pioneer 4' x 8' double deck screen. Rebuilt.
27½ ton, single-compartment 8' x 12' bin.
60-ton, two-compartment, 8' x 18' storage bin with clam gates.
100-ton, two compartment, 13' x 23' bin
Special bins to your specifications.
Conveyors—18"—24"—30"—36". Also conveyor belting.

SHOVELS AND CRANES

P & H 855B-LC, 2-yd. diesel dragline.
P&H 655B 1½ yd. diesel dragline.
Lorain L-79, 1½-yd. diesel shovel.
Bay city 65, 1-yd. diesel crane.
Lorain L-50K6, 1-yd. diesel backhoe. Excellent.
Lorain L-40, ¾-yd. diesel crane.
Lorain L-25K, ¾-yd. gas clamshell.
Lorain L-41 ¾-yd. diesel backhoe
Lima 34 Paymaster ¾-yard diesel shovel. Good
Unit 1020 ¾-yard diesel powered shovel-crane
Lorain TL25S ¾-yd. gas clam-crane.
Insley K-12, ½ yd. gas clam-crane
Koehring 304 ¾-yd. diesel shovel.
Koehring 304 ¾-yd. diesel backhoe
Wayne 50B, 25-ton truck crane. 18 mos. old.
Lorain MC-414 20-ton Moto-Crane
Link Belt HC-90 25-ton truck crane
Lorain MC-504W 25-ton Moto-Crane.
Lorain MC-4 15-ton Moto-Crane.
Lorain TL-20 10-ton gas Moto-crane.
Lorain SP-107, 7-ton self-propelled crane
Michigan TM16, 7-ton gas truck crane.

TRACTORS, TRUCKS, SCRAPERS, ETC.

2—Euclid TS-18 twin engine scrapers.
2—Euclid 18-yd. overhung engine scrapers.
1—Euclid 15½-yd. six wheel scraper.
1—Euclid TC-12 twin engine tractor.
5—Euclid 22-ton rear dumps. Excellent.
1—Euclid 18FD, 15-ton rear dump.
1—Mack LRS 15-ton rear dump. Rebuilt
1—Pullman S-600, 6 to 8 yard scraper.
1—Caterpillar DW-10 hydraulic scraper.
1—International TD-14A tractor with PCU
1—International TD 18 with Bucyrus-Erie bulldozer blade. Excellent condition.
1—Euclid tractor with 3200 gallon water tank semitrailer.
1—Caterpillar D-7 with cable bulldozer blade.
1—Caterpillar D-6 with hydraulic angledozer blade.
1—Caterpillar D-4 Tractor only
1—International 300 tractor, with loader back hoe.
1—LaPlante choate 13½-yd. Cable scraper
1—Atco H85, 10½-yd. Hydraulic scraper

SHOVEL ATTACHMENTS

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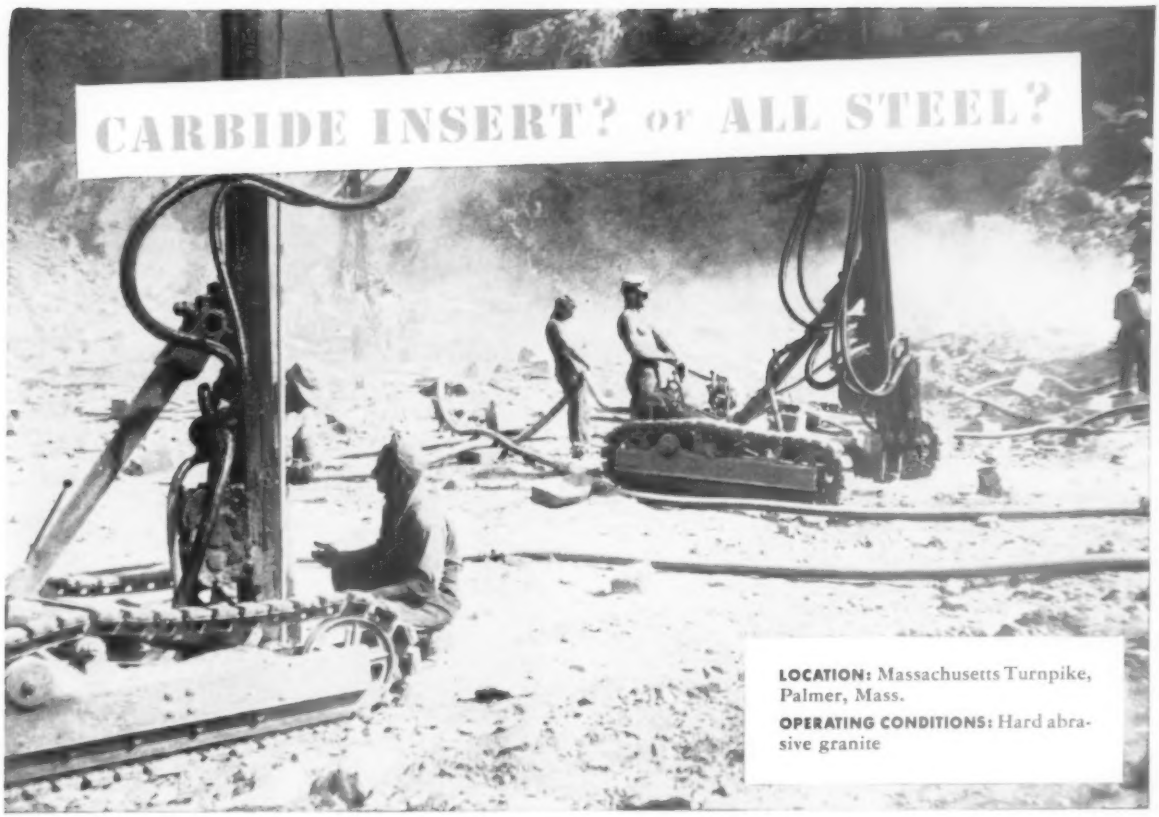
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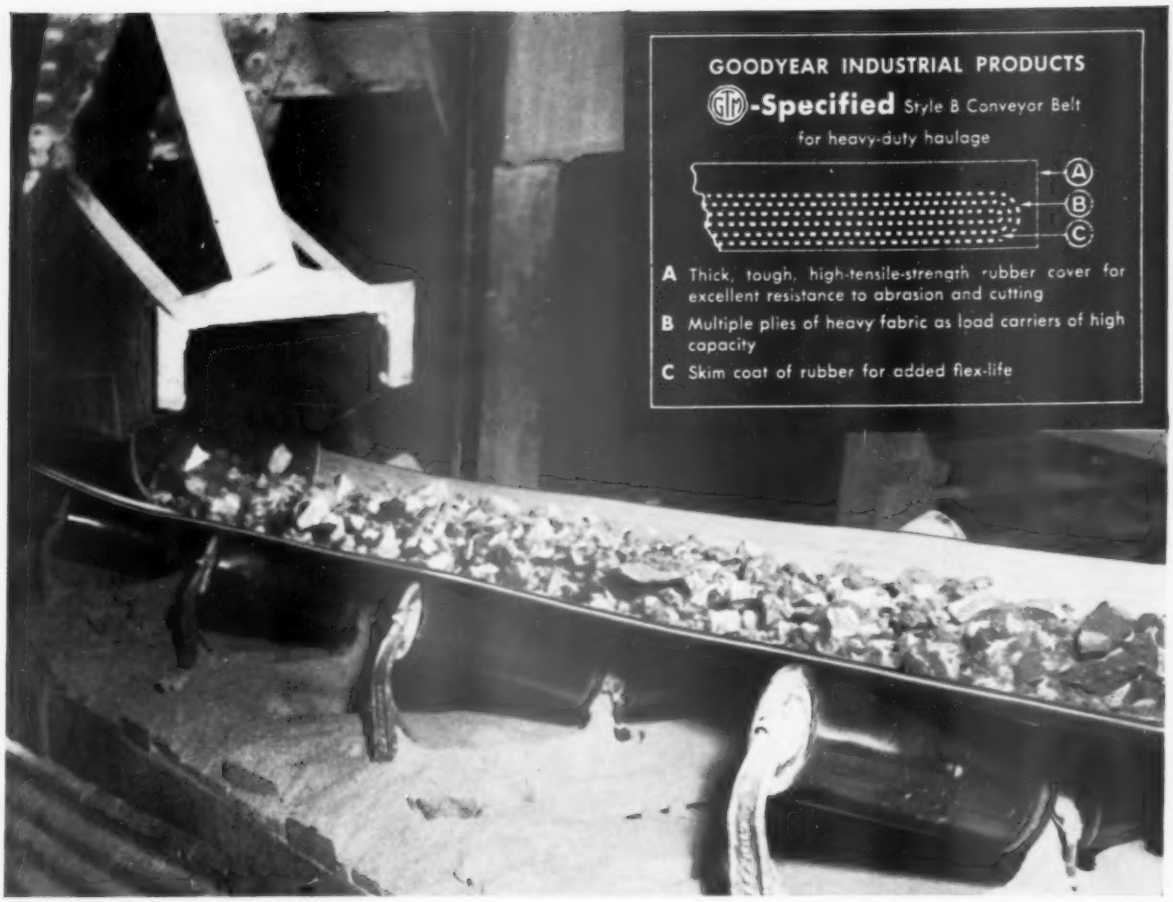
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